T H E P H O N O L O G Y
OF
T H E V E R B A L P I E C E
IN
C O L L O Q U I A L B E N G A L I

THESIS

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QAZI DIN MUHAMMAD

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ABSTRACT

In order to focus attention on correspondences between the grammatical and phonological levels of linguistic statement, the results of the present phonological analysis are presented within a grammatical framework set up in Part I, (Chapters 1 - 3).

Part Two of the thesis includes Chapters 4 - 6. Chapter 4 gives relevant details about the Texts presented at different levels : Orthography, Roman transliteration and Phonetic transcription.

Chapters 5 and 6 give a detailed description in general phonetic terms of the pronunciation of Bengali verbal forms. - Chapter 5 deals with the vowel articulations and Chapter 6 the consonantal articulations.

Part Three includes Chapters 7 - 11. In Chapter 7 the elements of the Phonological analysis in terms of Phonematic units and Prosodic elements are stated.

Two morphological abstractions are made for all verbal forms : viz. Stem and Ending. At the Phonological level syllables are named stem syllables and ending syllables. The structures of Endings are discussed in Chapter 8. Chapter 9 gives details about the V elements of structure. Chapter 10 gives a Phonological account of vowel harmony.

Chapter 11 deals with the C elements of Phonological structure in the stem.

Appendix 1 provides a list of verbal forms in Colloquial Bengali.

Appendix 2 provides text of recordings of the verbal forms listed in the end of Chapter 1, and those used for the Palatograms and the Kymograms.

Appendix 3 gives a brief Bibliography.

In making the phonetic abstractions Palatograms and Kymograms are provided in the thesis. More Palatograms and Kymograms are provided in the appendix 4.

A grid and two records are provided in the pocket at the back of the thesis.

ACKNOWLEDGEMENT

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List of palatograms

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2. [c̪ip]
3. [t̪ip]
4. [tap]
5. [pa]
6. [pak]
7. [kac̪]
8. [pit̪]
9. [pat]
10. [map]
11. [cipe]
12. [c̪ume]
13. [t̪ok]
14. [dibi]
15. [dobo]
16. [boki]
17. [bɔko]
18. [muchi]
19. [moc̪ho]
20. [pit̪i]
21. [pit̪o]
22. [kut̪i]
23. [kot̪o]
24. [lɔo]
25. [likhi]
26. [boli]
27. [bɔlo]
28. [rɔe]
29. [pori]
30. [pɔro]
31. [ʃape]
32. [ʃobe]
33. [bɔʃ]
34. [bɔʃo]
35. [miʃi]
36. [nabe]
37. [ane]
38. [man]
39. [nibi]
40. [bhaŋi]
41. [bhaŋ]
42. [pɔɽɸ]
43. [pɔɽɒ]
44. [bhaŋche]
45. [khabe]
46. [chape]
47. [jɔpe]
48. [j̪hume]
49. [t̪hek]
50. [ɖak]
51. [thame]
52, [dɔme]
53. [mɔthe]
54. [kace]
55. [manle]
56. [mɔth̪]
57. [palt̪e]
58. [manbe]
59. [bɔl]
60. [pɔre]
61. [pɔr]
62. [mile]
63. [mille]
64. [pate]
65. [patte]
66. [kacche]
67. [mante]
68. [korche]
69. [korte]
70. [korle]
71. [kocche]
72. [kotte]
73. [kolle]
74. [kacte]
75. [kaste]
76. [kat̪le]
77. [boʃche]
78. [boʃte]
79. [boʃle]
80. [bãc]
81. [nobo]
82. [khɔɳɖa]

List of Kymograms

1. [kãpe]
2. [nace]
3. [ʈane]
4. [man]
5. [pa]
6. [pat]
7. [pate]
8. [mat]
9. [bɔʃ]
10. [lag]
11. [tol]
12. [ʃon]
13. [pake]
14. [khaʈe]
15. [bujhe]
16. [bhoge]
17. [pak]
18. [dæ̀kh]
19. [bhog]
20. [bɨ̀jh]
21. [dhakkae]
22. [ɖakae]
23. [mɔckae]
24. [jɔpe]
25. [jopte]
26. [jobbe]
27. [dæ̀khe]
28. [dekte]
29. [khete]
30. [khacche]
31. [kace]
32. [degbe]
33. [kac]
34. [kace]
35. [gabe]
36. [ghame]
37. [cillae]
38. [chilae]
39. [pate]
40. [ʈip]
41. [ʈhek]
42. [tape]
43. [thame]
44. [dhɔre]
45. [piʈ]
46. [pat]
47. [ʃadh]
48. [lɔe]
49. [rɔe]
50. [pɔɽe]
51. [boʒbe]
52. [boʃte]
53. [ʃɔmjae]
54. [khamcae]
55. [ʈunʈunae]
56. [jhɔmjhɔmie]
57. [kacche]
58. [patte]
59. [jagle]
60. [pakle]
61. [korte]
62. [kotte]
63. [korche]
64. [kocche]
65. [kacte]
66. [bhaŋ]
67. [jɔm]
68. [kamɽae]
69 [cimʈae]
70. [jɔnmae]
70. [minminae]
72. [jombe]
73. [mante]
74. [mate]
75. [jɔme]
76. [hane]
77. [ane]
78. [mane]
79. [bhaŋe]

ABBREVIATIONS (general)

A. I. R.	All Indian Roman Alphabet.
Aux.	Auxiliary.
c. s.	Centi Seconds.
c. p. s.	Cycles per second.
Causat.	Causative.
F.	Finite.
F., Fam.	Familiar grade.
Fut.	Future Tense.
Hab.	Habitual.
H., Hon.	Honorific grade.
I. P. A.	International Phonetic Alphabet.
Imp.	Imperative.
Ind., Indic.	Indicative.
Infin., Infinit.	Infinitive.
Km., Kms.	Kymogram, Kymograms.
L	Larynx tracing .
M	Mouth tracing .
N	Nasal tracing.
Nf., Non-fin.	Non-finite.
O., Ord.	Ordinary grade.
Pm., Pms.	Palatogram, Palatograms.
p., pp.	Page, Pages.
Pl.	Plural number.
Perf.	Perfective. ~~person~~.
Pers.	Person.
Pres.	Present Tense.
Prog.	Progressive.

Simp.	Simple.
S., Sing.	Singular number.
1, 1st.	First Person.
2, 2nd.	Second Person.
3, 3rd.	Third Person.

(Books and Periodicals)

B.S.O.S.	Bulletin of the School of Oriental Studies, London.
B.S.O.A.S.	Bulletin of the School of Oriental and African Studies, London.
J.D.L.	Journal of the Department of Letters, Calcutta University, Calcutta.
J. P.	Journal de Psychologie.
J. R. A. S.	Journal of the Royal Asiatic Society, London.
L. S. I.	Linguistic Survey of India.
O. D. B. L.	The Origin and Development of Bengali Language.
T. P. S.	Transactions of the Philological Society, London.
T. C. L. P.	Travaux du Cercle Linguistique de Prague.

INTRODUCTION

Bengali is one of the major Indo-Aryan languages. In quality and in quantity of literary production it is the first and in general importance and in number of speakers it is second only to Urdu and Hindi. It is spoken by over ninety million people, more than half in East Pakistan and the rest in West Bengal, India.

Very little work has been done on the phonetics and phonology of the Bengali Language. It will not be incorrect to say that the spoken language has hardly been touched except in two works.[1] The first, Dr. S.K. Chatterji's 'Brief Sketch of Bengali Phonetics'[2] which is a pioneer work in Bengali and it was based mainly on Daniel Jones's Phoneme approach. It lacks precision and completeness on various points fundamental to an understanding of the Bengali sound system. The second and the most recent work on the language is 'A Phonetic and Phonological Study of Nasals and Nasalization in Bengali,'[3] by M.A.Hai, who utilizes all modern theoretical approaches to linguistic study. His work presents a good deal of phonetic detail inspite of its limited scope.

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1. There is another unpublished work by C.A.Ferguson, 'Phonology and Morphology of Standard Colloquial Bengali' (Ph.D. thesis, University of Pennsylvania, 1945), which I have not seen.
2. It is a separate reprint for the international Phonetic Association (London, Paris, 1921), of an original article published under the title 'Bengali Phonetics' in B.S.O.S. 2, Pp.1-25 (1921)
3. M.A. Thesis, University of London, 1953, Published by Dacca University, 1961.

It may be said here with all humility that I am the second student to undertake research in Colloquial Bengali on the basis of modern linguistic theories. It was found desirable to circumscribe my field of investigation. I have taken myself as an informant for the study of the problem. As one born and brought up in East Bengal and as a student and teacher of Bengali I myself speak that form of Bengali which is generally accepted by educated people as the standard and which is commonly understood all over Bengal. This kind of Bengali is used for broadcasting from Radio -Pakistan and for imparting instruction in educational institutions. However, whenever I was in doubt about the validity of a particular pronunciation, I checked my utterance with that of other Bengali speakers living in London while this research was being conducted. By choosing the verbal piece as my subject of Phonological study, I have further limited my material for intensive research.

Phonetic observation for this thesis was made kinaesthetically as well as through the techniques of Kymography and Palatography. I have made some recordings of my own speech and listened to them repeatedly. I used a mirror for visual aid. All the Kymograms and Palatograms were made as one word sentences uttered with a particular situation in mind; it is possible to set up relevant schematic constructs at the level of context of situation for all the sentences analysed in this thesis. The Kymograms and Palatograms produced in this thesis are chosen as typical for my pronunciation of the respective sentences, and in making this choice, the same sentences were

repeated several times on different days.

A grid for measuring Palatograms and gramophone records of the forms including those used to make Palatograms and Kymograms, are provided in a pocket at the back of the thesis.

In making the phonological statement of my findings, I set up a grammatical frame work for the language material under consideration. My attempt in this work is to state my phonological findings in relation to grammar, and to illustrate the relation between grammar and phonology. I have presented my statement in accordance with the requirements of the theory of the Prosodic approach to phonological analysis, which has been accepted as most conducive to an economical, consistent and comprehensive statement.[1]

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1. See F. R. Palmar, 'The 'Broken Plurals' in Tigrinya', B.S.O.A.S., XVII, 3. p.549.

P A R T O N E

GRAMMATICAL OUTLINE

CHAPTER 1 : Grammatical Categories

CHAPTER 2 : Some Main Syntactic Structures

CHAPTER 3 : Finite and Non-finite Verbal Forms

CHAPTER I

GRAMMATICAL CATEGORIES

1.0 General Outline.

1.1 Sentence types: Verbal and Non-verbal sentences.

1.2 Verbal sentences : Command and Non-Command.

1.3 Non-Command verbal sentences : Statement and Question.

1.4 Affirmative and Negative sentences.

1.5 Simple and Compound sentences.

1.6 Verbal Clause: Simple and Compound.

1.7 Verbal forms: Finite and Non-finite.

1.8 Verbal phrases: Finite and Non-finite.

1.9 Simple and Compound phrases.

1.10 Simple and Compound forms.

1.11 Indicative verbal forms.

1.12 Personal Pronouns.

1.13 Category of Number.

1.14 Category of Person.

1.15 Category of Grade.

1.16 Category of Tense.

1.17 Imperative verbal forms.

1.18 Causative and Non-Causative verbal forms.

1.19 Non-finite verbal forms.

1.20 Illustration of the verbal forms.

CHAPTER I

GRAMMATICAL CATEGORIES

1.0 This section is an outline statement of some of the grammatical categories to be used in certain verbal forms in colloquial Bengali. It is based partly on a phonological analysis and partly on syntactical analysis. The phonological statement will be made within the grammatical framework, for, 'a phonological statement made without considering the needs of grammatical analysis is not conducive to an economic statement of facts.'[1]

For the analysis of sentences as a whole it is necessary to make a brief statement about the different types of sentence.

1.1 Sentences are of two types: verbal and non verbal.

Verbal sentences are characterized by the presence of a verbal form and non-verbal sentences are characterized by the absence of a verbal form.

---

1. F.R.Palmer, "The 'Broken Plurals' of Tigriniya" - B.S.O.A.S., XVII, 3, p.549.
   In this outline of grammatical categories a verbal sentence with a finite verbal phrase in it is considered.
   A sentence containing one or more non-finite verbal phrases but not containing a finite verbal phrase, is excluded from consideration. The verbal forms themselves are not, however, excluded, and on examination they are seen to be similar in form and function to those non-finite verbal forms occurring in verbal sentences.

A verbal form is one of a recognizable set of forms taking part in an inflectional paradigm. On the basis of their morphology this scatter of verbal forms can be listed in a number of sentences and can be shown to lie in some relation with other forms in the sentence with respect to person or grade.

Thus, ʃe aʃe [1] 'he comes' is a verbal sentence characterized by the presence of the verbal form aʃe.

ʃe bhalo chele (he good boy) 'he is a good boy' is a non-verbal sentence characterized by the absence of a verbal form.

This study is concerned with the verbal sentences only.

1.2 Verbal sentences can be classified under two headings:

(i) Command and

(ii) Non-Command.

Command sentences function in simple present and future tenses and are restricted to two persons, second and third in all grades.[2] They do not function in the different aspects that are seen in non-command sentences.

Thus: tumi khelo 'play !'
khæl 'play !'
khelo 'play! ' (in future)
kheliʃ 'play! ' (in future)

are command sentences.

---

1. All texts in thisPart (Ch.1-3) are in a reading transcription.
2. Imperative verbal forms do not function in different aspects. See p. 29

Non-Command sentences are those that have verbal forms which take part in the full paradigmatic range of verbal forms.

Thus, ʃe khæle 'he plays', and tumi khælo 'you play' are non-command sentences.

1.3 Non-Command sentences are again classified into two :

i) Statement, and

ii) Question.

Statement sentences are those which are characterized by particular intonation patterns and in which none of the interrogative particles occur. Thus, ʃe khæle 'he plays' is a statement sentence which has an intonation pattern ˋ— ˊ and in which no interrogative particles are found.

Question sentences are those which may have one of the interrogative particles ki, ke, kɔbe, kɔkhɔn, kotha, kenɔ etc, and are characterized by particular intonation patterns common to all questions of this type.

Thus, ʃe ki khæle [1] 'does he play?' is an interrogative sentence characterized by the presence of an interrogative particle ki, and has an intonation pattern ˙˙ ˊ ; and ʃe khæle 'does he play?' has an intonation pattern ˙ ˊ .

---

1. Interrogative particles can occur also in the sentence final position after the finite verbal phrase. But the style of speech considered here is not the same.

1.4 Each of these sentence types Command, Statement, and Question can again be classified into two:

(i) Affirmative, and

(ii) Negative.

.. All sentences in which one of the particles na and ni [1] occurs are negative sentences; and all other sentences are affirmative.

Thus, ʃe aʃe 'he comes', is an affirmative sentence characterized by the absence of a negative particle.

ʃe aʃena 'he doesnot come', ʃe aʃeni 'he did not come' are negative sentences characterized by the presence of the negative particle na or ni .

ʃe aʃe 'he comes' is an example of an affirmative statement sentence: ʃe ki aʃe 'does he come?'is an example of an affirmative question sentence; and tumi khælo 'play!' is an example of an affirmative command sentence type.

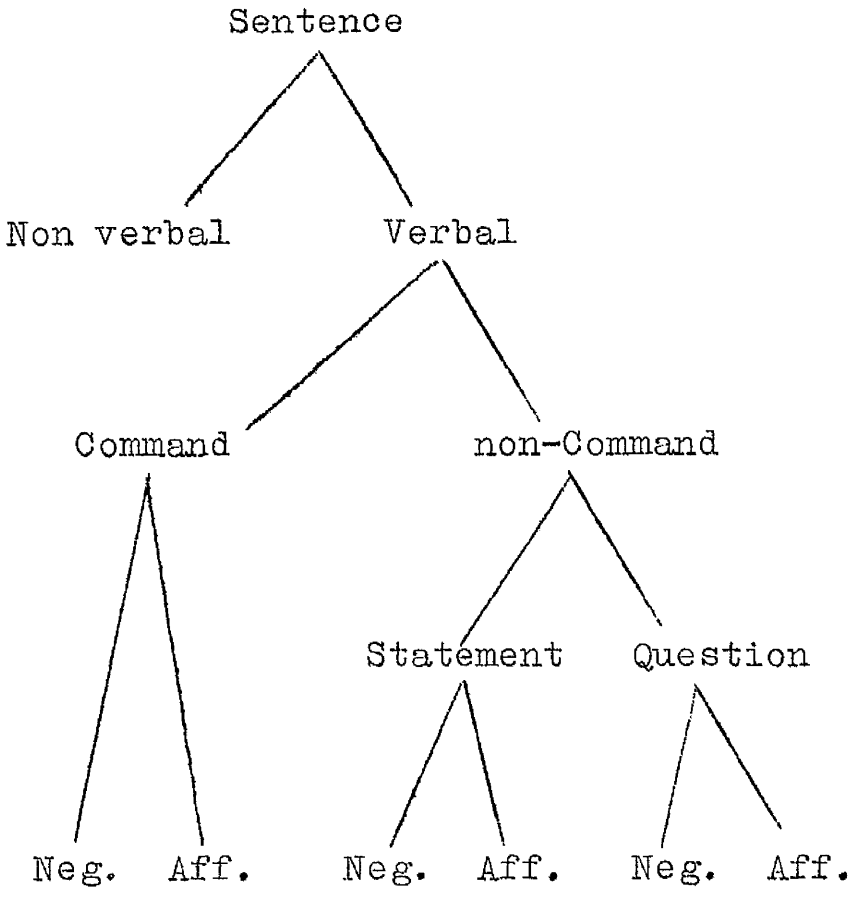
ʃe aʃena 'he does not come' is an example of a negative statement sentence; ʃe ki aʃena 'does he not come ?'is an example of a negative question sentence, and tumi khelona [2] 'don't play!' is a negative Command sentence.

---

1. A brief statement about the particles na and ni is made later. See p. 65
2. In negative Command sentences verbal forms are always found in the future tense. This is one restriction of Imperative sentences.

The frame work of classification of sentences outlined above may be shown in the following diagram.

Fig. I.



1.5 Verbal sentences may further be classified into two

i) Simple, and

ii) Compound.

By simple, is meant by definition, sentences having one verbal clause only.

Sentences having more than one verbal clause are compound sentences.

Thus: ʃe aʃe 'he comes' is a simple sentence characterized by the presence of only one verbal clause (in this case one form only).

ami bolchi je ʃe aʃe 'I say that he comes' is a compound sentence characterized by the presence of two verbal clauses, namely, ami bolchi and ʃe aʃe linked by the particle je .

Only simple sentences are considered here.[1]

1.6 The verbal clause of a simple sentence may consist of one or more verbal phrases.

A verbal clause having only one verbal phrase functioning at the sentence final position is a simple verbal clause; and a verbal clause having more than one verbal phrase is a compound verbal clause.

---

1. It will be seen that most of the statements made about the simple sentences will hold good for the compound sentences also. And so far as the phonology of the verbal piece is concerned the statement about the verbal piece in a simple sentence is also true for the verbal piece in compound sentences. That is to say no separate statement is necessary for the verbal piece in other types of sentences.

Thus, ʃe aʃe 'he comes' is a simple verbal clause characterized by the presence of a single verbal phrase only.

ʃe haʈte haʈte ghɔre aʃe 'walking he comes into the room' is a compound verbal clause characterized by the presence of two verbal phrases haʈte haʈte and aʃe .[1]

1.7 All verbal forms are classified under two headings:

a) Finite, ~~and~~

b) Non-finite.

Finite verbal forms are found in sentence final position.[2] Non-finite verbal forms do not function in the sentence final position in a simple affirmative sentence as defined above.

Certain relations between the finite and non-finite verbal forms may be shown as follows.

1.7 Where the final verbal phrase consists of a single verbal form this is found to be a finite form. Where the verbal phrase is made up of more than one verbal form it is non-finite plus finite.

1.8 Where the verbal phrase consists of (i) a single finite verbal form; or (ii) a non-finite plus finite verb forms functioning either as verb and operator, or as verb and auxiliary;[3] or (iii) two non-finite plus a finite verb form, functioning as verb-operator and auxiliary in structure

---

1. Two verbal phrases here are linked by a nominal form ghɔre.
2. Finite verbal forms also occur in the sentence, non-final position, but not in the style of speech considered here. This statement is true of the affirmative sentences. In negative sentences where the negative particle na or ni occurs finally the finite verbal form occurs in pre-final position.
3. For operator and auxiliary, see § 3.0.2.2.1 and 3.0.2.2.2.

the phrase will be called a finite phrase; and the phrase containing one or more non-finite forms outside the structures mentioned above or in any place in the sentence will be called a non-finite phrase.

1.9 Where the verbal piece consists of a single finite phrase as mentioned above, it is a simple phrase, where the verbal piece contains a non-finite verb-phrase plus a finite verbal phrase it is a compound phrase.

1.10 Where the finite verbal phrase consists of a single finite verbal form it is a simple verbal form; where it consists of two or three forms within a simple phrase, it is a compound form.

In ~~usual~~ Colloquial Bengali a maximum of five verbal forms in succession are found in a simple sentence.[1] These may be divided according to the criterion stated above.

Thus:

ʃe boi pɔ̃ɽe 'he reads the book'

ʃe boi poɽe phello 'he has finished reading the book'

ʈar boi poɽe phela hɔlo 'he finished reading the book'.

pɔɽe, poɽe phelɪ̈o, and poɽe phela hɔlo are all finite verbal phrases.

---

1. It is theoretically possible to have sentences with more than five forms, but not in usual Colloquial Bengali. See § 3.0.4.

ʃe dekhte dekhte boi-khani poṛe phello

tar boi khani dekhte dekhte poṛa hoe gelo

ʃe boi-khani dekhte dekhte poṛe phello

'He finished reading the book within a short time'

In each of these sentences, dekhte dekhte is a non-finite phrase.

Finite verbal forms in command sentences will be referred to as Imperative verbs, and those in Non-Command sentences will be referred to as Indicative verbs.

Non-finite verbal forms either in the finite phrase or in the non-finite phrase have a limited number of endings, namely, -e, -a, -le, -te and -on for non-causative form, and -e -no, -le, -te for causative and extended forms.[1] The detailed function of non-finite forms and their endings will be discussed later.[2]

1.11 Indicative Finite Verbal Forms.

Finite Verbal forms can be inflected to show:

i) Person,

ii) Grade, and

iii) Tense.[3]

That is, finite verbs have sets of related forms which can be presented in paradigm.

Non-finite verbal forms are not inflected for Person, Grade and Tense.[4]

---

1. See § 3.4. & See § 1.18. (infra)
2. See § 3.4. Non-finite verbal forms, their endings and their function and position.
3. These will be discussed presently. See for Person § 1.14, for Grade § 1.15 & for Tense § 1.16.
4. They are inflected in terms of causative and non-causative, the reference to which will be made towards the end of this chapter.

The statement of a finite verbal form will have reference to all three categories, that is, any verbal form will have formal characteristics relating to Person, Grade and Tense.

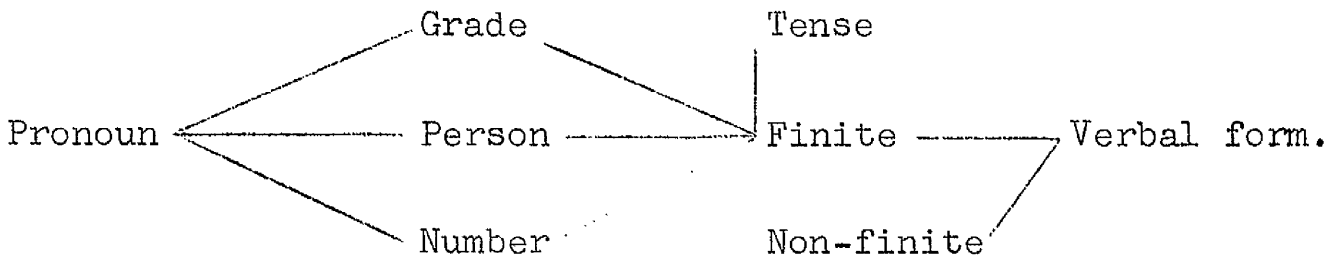
There is a colligational relation between the finite verbal form and the personal pronoun in terms of Person and Grade.

1.12 The personal pronouns are stateable in terms of three categories:

1) Number
2) Person
3) Grade

Features of the finite verbal forms which refer to Person and Grade will correlate with features in the pronouns that relate to Person and Grade.

This may be shown in the following diagram.



For convenience of reference a list of the pronominal forms referred to as having Person, Grade and Number distinction is given.

It should be noted that there are no honorific ordinary and familiar forms for pronouns of the first person.

Personal Pronouns

Person	1	2			3	
Grade		F	O	H	F/O	H
Sing.	ami	tui	tumi	apni	ʃe, e, o	tini, uni, ini
Pl.	amra	tora	tomra	apnara	tara, era, ora	tãra, õra ẽra

1.13 Number

It is to be noted that no category of number for the verbal forms is required. For, the verbal forms do not exhibit any distinction between singular and plural number, that is, they exhibit a common form for all numbers. Number has a formal function in the nominal piece and in the sentence as a whole.

Thus:

Sing. tumi aʃo 'you come'. ʃe aʃe 'he comes'.

Pl. tomra aʃo 'you come'. tara aʃe 'they come'.

1.14 Person

In this category a system of three terms will be stated. They will be referred to as first, second and third person, and marked in the table as 1, 2, and 3.[1]

There is colligation between these terms and the terms in the personal pronoun system. The following examples

---

1. Indicative finite verbal forms of all statement and question sentences function in all these persons. Imperative verbal forms in command sentences function only in second and third person.

will illustrate this.

1. ami aʃi 'I come'.

2. tumi aʃo 'you come'.

3. ʃe aʃe 'he comes'.

1.15 Grade

In this category three terms will be used. They are Honorific, Ordinary, and Familiar - marked as H, O, and F.

A further note is required about Grade. In order to state this fully, reference must be made to situation, particularly in respect of the relation between speaker and listener.

By Honorific forms are meant those forms which collocate with apni, apnara, tini, tãra, uni, õra, ini, ẽra, and which are, in one context of situation, used in addressing one's equals or superiors in society.

By Ordinary forms are meant those forms which collocate with tumi, tomra, and which are, in one context of situation, used in addressing one's equals or inferiors in society.

By Familiar forms are meant those forms which collocate with tui, tora, ʃe, tara, e, era, o, ora, and which are, in one context of situation, used in addressing one's inferiors in society.

The following examples will illustrate this.

2.H. apni aʃen 'you come'.

2.O. tumi aʃo 'you come'.

2.F. tui aʃiʃ 'you come'.

3.H. tini aʃen 'he comes'.

3.O/F. ʃe aʃe 'he comes'.

1.16 Tense

In the category of tense a system of three terms will be referred to as Future, Present and Past.

These tenses will be sub-divided into two groups: Simple and Compound.

Future tense functions only in simple groups, while present and past tenses function both in simple and compound groups.

Compound groups can again be sub-divided into three aspects.[1]

i) Progressive,

ii) Perfective, and

iii) Habitual.

Present tense functions only in progressive and perfective aspects, and past tense functions in all three - Progressive, Perfective and Habitual aspects.

The three tenses classified in two different ways may be shown in a tabular form. The functioning of the tense and aspect found is shown by a tick.

Group	Aspect	T E N S E S		
		Future	Present	Past
Simple		✓	✓	✓
Compound	Progressive		✓	✓
"	Perfective		✓	✓
"	Habitual			✓

1. In traditional grammar books tenses have been treated under as many as 11 or 12 sub-headings. See S. Page, Introduction to Colloquial Bengali, W. Heffer and Son, Cambridge, 1934, p.137 ff. See also S.K. Chatterji, Sankhipta Bhasha Prakash Banga la Byakaran, Calcutta 1945, pp. 284 ff.

Indicative verbal forms of all Statement and Question sentences function in all these tenses and aspects.

The formal and functional distinction of these tenses and aspects will be discussed only very briefly in this chapter. A further description will be given in the chapters dealing with the phonological statement.

Before going into details I give below in tabular form the different endings that are found with different persons and grades in the indicative verbal system, in different aspects and tenses in Colloquial Bengali.

Persons	1	2			3	
Grade		F	O	H	F/O	H
Aspects						
Simp.Pres.	-i	-iʃ	-o	-en	-e	-en
Prog. "	-chi	-chiʃ	-cho	-chen	-che	-chen
Perf. "	-echi	-echiʃ	-echo	-echen	-eche	-echen
Simp.Past	-lam	-li	-le	-len	-lo	-len
Prog. "	-chilam	-chili	-chile	-chilen	-chilo	-chilen
Perf. "	-echilam	-echile	-echile	-echilen	-echilo	-echilen
Habit. "	-tam	-tiʃ	-te	-ten	-to	-ten
Simp.Fut.	-bo	-bi	-be	-ben	-be	-ben

Various Formal distinctions in forms in different tenses can be shown thus:

(1) A form in the Future tense is characterized by the presence of a -b- (voiced bilabial plosive) element in the ending .

(2) A form in the past tense is characterized by the presence of either a -l- (voiced lateral) or a -t- (voiceless dental plosive) element in the ending.

(3) A form in the Present tense is characterized by the absence of a -b-, -l- or -t- element in its ending.

The following distinctions with respect to different aspects occur:

(1) A form in the Progressive aspect (both present and past) takes an infix -ch- (voiceless aspirated alveolo-palatal plosive) before the ending of the simple ~~aspect~~ form.

(2) A form in the Perfective aspect (both present and past) takes yet another infix -e- before the ending of the Progressive aspect form.

The following examples will illustrate this:

1.	Simple present	ʃe aʃe	'he comes'
2.	Progressive "	ʃe aʃche	'he is coming'
3.	Perfective "	ʃe eʃeche	'he has come'.
4.	Simple past	ʃe aʃlo	'he had come'
5.	Progressive "	ʃe aʃchilo	'he was coming'
6.	Perfective "	ʃe eʃechilo	'he had come'
7.	Habitual "	ʃe aʃto	'he used to come'.
8.	Simple future	ʃe aʃbe	'he will come'.

1.17 Imperative Verbal Forms

In the Imperative forms (of Command sentences) a

system of two Persons, second and third, three Grades, Familiar, Ordinary and Honorific, and two Tenses, Present and Future are stated. Aspects are not stated for the Imperative forms.

Below are the different endings that are found with different Persons, Grades and Tenses in the Imperative verbal system.

Person	2			3	
Grade	F	O	H	F/O	H
Present	∅*	-o	-un	-uk	-un
Future	-iʃ	-o	-un	-uk	-un

The forms in Present and Future Tenses in second person Honorific, third person Familiar/Ordinary and third person Honorific Grades have similar endings. It will be seen that like Indicative forms, Imperative forms in second Person Honorific and third Person Honorific show no distinction.

It is to be noted that the Imperative forms in -iʃ ending are similar to the Indicative forms in -iʃ ending, and the Present Imperative forms in -o ending are similar to the Indicative forms in -o ending.

Forms in Present -o and Future $_{\wedge}^{-O}$ endings are different.[1]

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* ∅ represents zero ending.

1. This will be made clear in Chapter dealing with vowel harmony. See Ch. 10.

The following examples will illustrate the above statement.

1.	Present	2nd person	Familiar:	tui kaṭ	'cut! '
2.	"	"	Ordinary:	tumi kaṭo	'cut! '
3.	"	"	Honorific:	apni kaṭun	'please cut! '
4.	"	3rd "	Fam/Ord:	ʃe kaṭuk	'let him cut'
5.	"	"	Honorific:	tini kaṭun	'let him cut'
6.	Future	2nd "	Familiar:	tui kaṭiʃ	'cut! '(in future)
7.	"	"	Ordinary:	tumi keṭo	'cut!' " "
8.	"	"	Honorific:	apni kaṭun	'please cut!" "
9.	"	3rd "	Fam/Ord:	ʃe kaṭuk	'let him cut'" "
10.	"	2nd "	Honorific:	tini kaṭun	'let him cut'" "

1.18 Causative and non-Causative

Verbal forms in Colloquial Bengali can be treated under two headings:

i) Non-Causative, and

ii) Causative.

Every verbal form belongs to one of these two classes. Formal distinction between these two classes will be discussed in the phonological statement. Their functional distinction may be stated here with reference to a limited number of sentences chosen as my texts for the purpose. Structure of the sentence as a whole and the type status of the verbal piece are interrelated.

Both non-causative and causative can function as finite as well as non-finite.

The following examples will illustrate the above statement.

Finite

(i) Non-Causative: ʃe pɔɽe 'he reads'

(ii) Causative: ʃe pɔɽae 'he causes to read', 'he teaches'.

Non-finite

(i) Non-Causative: ʃe likhe pɔɽe 'having written he reads' 'he writes it and then reads'

(ii) Causative: ʃe likhie pɔɽe 'he having got written reads' 'he has it written and then reads it'.

1.19 Non-finite forms

It has been said that, unlike finite verbal forms, non-finite verbal forms are not inflected for Person, Grade and Tense. The following are the endings found in non-finite forms.

Non-Causative: -a, -e, -on, -te, -le.

Causative: -no, -e, -te, -le [1]

Examples:

(i) -e : ciṭhikhani lekhe ano 'bring along the letter when you have finished writing'.

(ii) -no : take ɔto khaṭano ucit nɔe 'It is not proper to make him work so hard'.

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1. There are two more endings which function with non-finite verbal forms. They are -ba and -bar. The reason for excluding them here has been discussed in the section dealing with the non-finite endings: their functions and position. See § 1.2.7. and § 3.4. See S. Page, An Introduction to Colloquial Bengali, 1934, p.155.

1.20 The categories set up above will now be illustrated by arranging the 'formal scatter' [1] of one verb in category columns. The verb chosen is kaṭa 'to cut'. The forms will be arranged under two main heads : non-causative and Causative, and under each of these, indicative, imperative and non-finite verbal forms will be setoup.

Non-Causative verbal forms

Indicative

Person	1	2		
Grade		F	O	H
Simp.Pres.	kaṭi	kaṭiʃ	kaṭo	kaṭen
Prog. "	kaṭchi	kaṭchiʃ	kaṭcho	kaṭchen
Perf. "	keṭechi	keṭechiʃ	keṭecho	keṭechen
Simp.Past.	kaṭlam	kaṭli	kaṭle	kaṭlen
Prog. "	kaṭchilam	kaṭchili	kaṭchile	kaṭchilen
Perf. "	keṭechilam	keṭechili	keṭechile	keṭechilen
Habit."	kaṭṭam	kaṭṭiʃ	kaṭṭe	kaṭṭen
Future	kaṭbo	kaṭbi	kaṭbe	kaṭben

1 . This term is used in the sense used by Prof. J.R. Firth in his 'Technique of Semantics', T.P.S., 1935, p.62; and later by F.R.Palmer in 'The Verb in Bilin', B.S.O.A.S. XIX, 1, p.131.

Imperative

Person	2			3	
Grade	F	O	H	F/O	H
Present	kaṭ	kaṭo	kaṭun	kaṭuk	kaṭun
Future	kaṭiʃ	keṭo	kaṭun	kaṭuk	kaṭun

Non-finite kaṭa, keṭe, kaṭon, kaṭṭe, kaṭle.

Causative forms

Indicative

Person	1	2		
Grade		F	O	H
Simp.Pres.	kaṭai	kaṭaʃ	kaṭao	kaṭan
Prog. "	kaṭacchi	kaṭacchiʃ	kaṭaccho	kaṭacchen
Perf. "	kaṭiechi	kaṭiechiʃ	kaṭiecho	kaṭiechen
Simp.Past	kaṭalam	kaṭali	kaṭale	kaṭalen
Prog. "	kaṭacchilam	kaṭacchili	kaṭacchile	kaṭacchilen
Perf. "	kaṭiechilam	kaṭiechili	kaṭiechile	kaṭiechilen
Habit."	kaṭatam	kaṭatiʃ	kaṭate	kaṭaten
Future	kaṭabo	kaṭabi	kaṭabe	kaṭaben

Imperative

Person	2			3		
Grade	F	O	H	F/O	H	
	kaṭa kaṭaʃ	kaṭao kaṭio	kaṭan kaṭan	kaṭak kaṭak	kaṭan kaṭan	

Non-finite : kaṭano, kaṭie, kaṭate, kaṭale.

CHAPTER II

SOME MAIN SYNTACTIC STRUCTURES

2.0 General outline of structures

2.1 Sentence constructions : Active and Passive

2.2 N_1 N_2 Vb. structure.

2.3 N Vb structure.

2.4 Vb structure.

2.5 Finite verbal forms in the two constructions: Active and Passive.

2.6 Illustration.

CHAPTER 2

SOME MAIN SYNTACTIC STRUCTURES

2.0 Simple verbal sentences in colloquial Bengali are mainly found in the following main syntactic structures.

i. Vb. A finite verbal phrase

ii. N Vb. A noun phrase and a finite verbal phrase.

iii. N N Vb. Two noun phrases and a finite verbal phrase

The following examples will illustrate these.

i.	Vb.	pɔɽo	'read!'
ii.	N Vb.	khoka pɔɽe	'A boy reads'.
		khokaṭi pɔɽe	'The boy reads'.(particular boy).
iii.	N N Vb.	khoka boi pɔɽe	'A boy reads a book.'
		khokaṭi boikhani pɔɽe	'The boy reads the book'.

2.1 In an examination of some Vb, N Vb, and N N Vb sentence structures two constructions,

I. Active, and

II. Passive

can be stated on a formal basis.[1]

The active construction is characterized in its noun or nouns being with or without a post fix ofacertain set, and verb is in paradigm according to aspect, tense, person and grade.

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1. It will be noted that any Bengali simple verbal sentence will fit in one of these structures. This analysis on the basis of structure takes account of all the sentence patterns: Kartri bacya, karma bacya, bhaba bacya and Karma-Kartri bacya - described in the traditional grammar, on the basis of 'potential meaning'.

The passive construction is characterized in its N_1 having always a post fix of a certain set, in which -r is a characteristic feature, and N_2 with or without a post fix.[1]

The verb consists of a non-finite form plus a finite verb-form of any of the stems of auxiliary verbs.[2] The finite verb in this construction is always in the third person ordinary grade and in paradigm according to tense and aspect.[3]

2.2 In the case of an active sentence of N_1 N_2 Vbtype, the nouns may or may not be characterized by a post fix. The -r feature is not found as an essential feature in N_1 in this type of structure. Auxiliary verbs do not occur in this construction.[4]

2.3 In the case of a sentence of N Vb type the noun may either be N_1 or N_2 of either constructions - active or passive, which will be recognized by the presence or absence of a post fix of a certain set and also by the context. In the passive sentence construction the verb phrase must have an auxiliary form in it.

2.4 In the case of a sentence type Vb the verb may either be a simple finite verbal form, or non-finite plus finite verbal form in paradigm of aspect, tense, person and grade.

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1. A study of the case system of the noun is not undertaken here.
2. See for Auxiliaries - their function, position and meaning, § 3.2
3. Supra.
4. It should be noted that -r post fix is a particular feature with N_1 of the structure N_1 N_2 Vb in passive construction. N_2 of this structure and N of N Vb structure can occur with or without a post fix.

2.5 In the passive construction the finite verb form is always found from one of the stems of auxiliary verbs, and the finite verb in this type of construction is always in the third person, Ordinary Grade and in paradigm of Tense and aspect. In the Active construction the finite verb is never found with an auxiliary form.

These structural features of the Active and Passive sentences can be formulated thus:

'( )' will indicate the possibility of either presence or absence of the element that is signified by the symbol within them; F indicates Finite verbal form;

NF indicates non-finite verbal form.

	N_1	N_2	Vb	
I. ACTIVE	N(P)	N(P)	(NF) F	Paradigmatic relation.
II. PASSIVE	N P	N(P)	NF F/AUX.	

2.6 I give below a few examples from spoken Bengali in order to illustrate the points discussed above in groups. For convenience I have chosen examples with one Person, one Grade and one Tense.

I. ACTIVE

1.	pɔɽe (reads)		'he reads'			Vb
2.	khoka (a boy	pɔɽe reads)	'A boy reads'.		N	Vb
3.	khoka (a boy	boi book	pɔɽe reads)	'A boy reads a book'.	N N	Vb

I ACTIVE (continued)

4. khokaʈi boi pɔɽe Np N Vb
(the boy book reads) 'The boy reads a book'.

5. khoka boikhani pɔɽe N Np Vb
(a boy the book reads) 'A boy reads the book'

6. khokaʈi boikhani pɔɽe Np Np Vb
(the boy the book reads) 'The boy reads the book'.

II. PASSIVE ?

7. pɔɽa hɔe Vb
(to read is) 'It is read'.

8. khokar pɔɽa hɔe N Vb
(by a boy to read is) 'A boy reads'.

9. boi pɔɽa hɔe N Vb
(a book to read is) 'A book is read'.

10. khokaʈir pɔɽa hɔe Np Vb
(by the boy to read is) 'The boy reads'.

11. boikhani pɔɽa hɔe Np Vb
(the book to read is) 'The book is read'.

12. khokar boi pɔɽa hɔe Np N Vb
(by a boy a book to read is) 'A boy reads a book'.

13. khokaʈir boi pɔɽa hɔe Np N Vb
(by the boy a book to read is) 'The boy reads a book'.

14. khokaʈir boikhani pɔɽa hɔe Np Np Vb
(by the boy the book to read is) 'The boy reads the book'.

15. khokar boi khani pɔɽa hɔe Np Np Vb
(by a boy the book to read is) 'A boy reads the book'.

In the above examples, the grammatical elements of structure (i.e. the word classes) can be stated as follows:

Sentences 1 and 7.	Verb (Vb)
Sentences 2, 8-11	Noun Verb (N Vb)
Sentences 3-6, and 12-15	Noun Noun Verb (N N Vb)

That is, sentences Nos. 1 and 7 are constituted of one constituent, viz. verbal element; sentences 2 and 8-11 are constituted of two constituents, viz. Nominal and verbal elements; and sentences 3-6 and 12-15 are constituted of three constituents, viz. Nominal, Nominal and verbal elements.[1]

I give below in tabular form an analysis of all the fifteen sentences on this formula. (In the formula the following notations are used: N_1 = first nominal element, N_2 = Second nominal element, Vb = verbal element in the sentence. N (without any notation) = noun without any particle, NP = noun with particles. The particles are shown by hyphens in the examples).

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1. This is only with reference to the sentences already cited. But N clause is not always a one word clause. Even where the N clause has more than one word, however, the head of the endocentric construction is always statable as N.

	N_1		N_2		Vb	
	N	NP	N	NP	Simple finite	Non-finite + finite
I.ACTIVE						
1.					pɔɽe	
2.	khoka				pɔɽe	
3.	khoka		boi		pɔɽe	
4.		khoka-ʈi	boi		pɔɽe	
5.	khoka			boi-khani	pɔɽe	
6.		khoka-ʈi		boi-khani	pɔɽe	
II. PASSIVE						
7.						pɔɽa hɔe
8.		khoka-r				pɔɽa hɔe
9.	~~boi~~		boi			pɔɽa hɔe
10.		khoka-ʈi-r				pɔɽa hɔe
11.		~~boi-khani~~		boi khani		pɔɽa hɔe
12.		khoka-r	boi			pɔɽa hɔe
13.		khoka-ʈi-r	boi			pɔɽa hɔe
14.		khoka-ʈi-r		boi-khani		pɔɽa hɔe
15.		khoka-r		boi-khani		pɔɽa hɔe

An analysis of these sentence structures will show that the establishment of the two groups of construction on the formal evidence is justified.

In group I (sentences 1 - 6) the verb is a simple finite verbal form.

In group II (sentences 7 - 15) the verb is a combination of a non-finite verbal form plus a finite verbal form formed from the stem he.

In sentences Nos. 2 and 9 N is without any particle.

In sentence 11 N is with a particle -Khani

In sentence 3 both N_1 and N_2 are without any particle

In sentence 4 N_1 is with a particle -ţi and N_2 is without any particle.

In sentence 5 N_1 is without any particle, N_2 is with a particle -khani .

In sentence 6 N_1 is with a particle -ţi and N_2 is with a particle -khani .

In sentence 8 N is with a particle -r .

In sentence 10 N is with a particle -r in addition to the particle -ţi-

In sentence 12 N_1 is with a particle -r , N_2 is without any particle.

In sentence 13 N_1 is with particles -ţi- and -r , N_2 is without any particle.

In sentence 14 N_1 is with particles -ţi- and -r , N_2 is with particle -khani .

In sentence 15 N_1 is with a particle -r , N_2 is with a particle khani .

CHAPTER 3

Finite and non-finite verbal forms: Simple and Compound verbs: Defective verbs: Auxiliaries: Operators: Non-finite endings: their function, position and meaning.

3.0	General outline.
3.0.1	One-form verbal piece : Vb.
3.0.2	Two-form verbal piece:
3.0.2.1	Simple verbal forms.
3.0.2.2	Compound verbal forms: Vb + O(perator) and Vb + A(uxiliary).
3.0.2.2.1	Vb + Operator.
3.0.2.2.2.	Vb + Auxiliary.
3.0.3	Three form verbal piece.
3.0.3.1	Compound verbal forms: Vb + O + A.
3.0.3.2	Other three form verbal piece.
3.0.4	Verbal piece with more than three forms.
3.1	Defective verbs.
3.1.0	General outline.
3.1.1	√‾ach / √‾chi
3.1.2	√‾ja / √‾gi
3.1.3	√‾a / √‾e
3.1.4	√‾bɔt
3.1.5	√‾nɔ
3.1.6	√‾ghɔt

3.1.7 √cuk

3.1.8 √baʃ

3.2. Auxiliaries : their function, position and meaning.

3.2.0 General outline.

3.2.1 √hɔ

3.2.2 √ach / √chi

3.2.3 √ja / √gi

3.2.4 √thak

3.3 Operators : their function, position and meaning.

3.3.0 General outline.

3.3.1 √kɔr

3.3.2 √pɔɽ

3.3.3 √mɔr

3.3.4 √dhɔr

3.3.5 √bɔʃ

3.3.6 √par

3.3.7 √mar

3.3.8 √lag

3.3.9 √thak

3.3.10 √dãɽa

3.3.11 √phel

3.3.12 √dekh

3.3.13 √tol

3.3.14 √‾pa

3.3.15 √‾ja / √‾gi

3.3.16 √‾de

3.3.17 √‾ne

3.3.18 √‾aʃ

3.3.19 √‾an

3.3.20 √‾uʈh

3.3.21 √‾hɔ

3.3.22 √‾ach / √‾chi

3.4 The Function, position and meaning of the non-finites.

3.4.0 General outline.

3.4.1 Ending -a

3.4.2 Ending -on

3.4.3 Ending -no

3.4.4 Ending -e

3.4.5 Ending -te

3.4.6 Ending -le

Finite and non-finite verbal forms: Simple and Compound verbs : Defective verbs : Auxiliaries : Operators : Non-finite endings : their function, position and meaning.

3.0 Certain problems connected with the analysis and description of the finite and non-finite verbal forms of Bengali will be discussed in this chapter.

Verbal forms occur in final and non-final position in the sentence.

The grammatical implications of verbs occurring in final position are different from those of verbs occurring in non-final position, and for a descriptive statement it is preferable to treat them separately.

First, I shall deal with those verbal forms that are generally found at the end of the simple affirmative statement and command sentence.

As will be seen the criterion of place and order, together with other formal and syntactical criteria, are used for the statement of such verbal forms.

As these verbal forms may be one or more within a final place in a sentence, it is preferable to refer to the whole section as a 'verbal piece' and its components as 'verbal forms'.[1]

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1. See § 1.6 - 1.10

The verbal piece in a simple sentence may consist of one or more forms, as can be seen from the examples given below. The verbal piece is underlined.

One-form verbal piece:

khoka boi pɔɽe
(a boy a book reads) 'A boy reads a book'

Two-form verbal piece:

khoka bhat kheye pɔɽe
(a boy rice having eaten reads) 'A boy reads after his meal'

Three-form verbal piece:

khokar bhat kheye pɔɽa hɔbe
(by a boy rice having taken to read will be) 'A boy will read after his meal'

Four-form verbal piece:

khoka bhat kheye ʃere pɔɽte bɔʃbe
(a boy rice having eaten having finished to read will sit)
'A boy will read after his meal'.

Five-form verbal piece:

khoka pɔɽa ʃona rekhe khelte gelo
(a boy to read to hear having left to play went
'A boy left ~~his~~ studying and went to play'

3.0.1 One-form verbal piece: Vb

A One-form verbal piece occurring in sentence final position is associated with the formal scatter of a single verb, and may appear with all possible alternants for the categories of aspect, tense, person and grade.

ʃe bhat khabe
(he rice will eat) 'He will take his meal'.

ami baɽi jai
(I home go) 'I go home'.

tumi iʃkule giechile
(you to school went) 'You went to school'.

3.0.2 Two-form verbal piece : Vb + Vb

Two-form verbal pieces occurring in sentence final position are of two types: Simple verbal form and Compound verbal form.

3.0.2.1 Simple verbal forms.

Where the final verbal form is finite and the pre-final form is a non-finite verbal form in any of the non-finite endings, -a, -e, -te, -le, -on, and -no,[1] and the two forms form two phrases which are not semantically interdependent, but are interrelated to express one action prior to another, they are found to be two simple verbal forms. Each of these verbs can be any one from the whole range of verbs. These are symbolized as Vb(nf) + Vb(f).

That these two verbal forms are two separate verbal phrases is distinguished by marked stress. In the characteristic utterances of these types of verbal piece in sentences two major stress[2] groups are recognized where each major stress group is a phrase. The pause between these forms and the

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1. These non-finite endings though apparently similar to some of the finite endings of the verbal paradigm, must not be confused with them. The functional implication of the non-finite endings and their positional meaning will be discussed later in detail. See § 3.4.
2. The expression 'major stress group' has the implication that there may be other stressed syllables within such groups; but the stress in such syllables is less prominent.
   Kymograms and Oscillograms were made for certain utterances of this description. But they have not provided any characteristics which could be correlated with the stating of major stress groups. This division is, therefore, made at the level of kinaesthetic observation.

possibility of insertion of some forms of other word classes, such as, nominals, adjectivals or particles, between them are also ~~the~~ formal criteria for distinction.

Examples:

ʃe hat-mukh 'dhuye 'khabe
(he hand-face having washed will eat) 'He will wash his hands and face and take his meal'.

tarik pensil 'keʈe 'likhlo
(Tarik pencil having cut wrote) 'Tarik wrote after sharpening the pencil'.

3.0.2.2 Compound verbal forms: Vb + O(perator) and Vb + A(uxiliary) 1

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1. There are two-form verbal pieces where both the verbal forms are finite. They are of two types:
(a) where both the forms are in the same aspect, tense, person and grade in regular paradigm. e.g. ami 'aʃbo 'jabo (with two stresses) (I shall come, I shall go) 'I shall come and I shall go'. tumi 'paro 'jao (you, you can, go) 'go there if you would'.
(b) where the two forms are not in the same aspects, tense, person, and grade. e.g. apni 'bɔlechen 'jabo (you, have said, I shall go) 'Since you have asked I shall go'.

On formal criteria it can be stated that these types of sentence are compound sentence and not simple sentences as defined. (See § 1.5 Ch. I, see also foot note 2 Ch.1. p. 20)

There is yet another type of two-form verbal piece where the two forms take the same ending. They together may either be used as finite or non-finite forms. The position of the two forms is collocationally fixed. e.g. eʃecho jɔkhɔn 'kheye deye jabe (you have come, when, having eaten, you will go) 'when you have come you must take your meal here'. khokader ekʈu 'dekho ʃuno (of the children, a little, see! hear!) 'please look after the children'. These are treated as doubled forms which imply an action of same nature or repetition of an action. A few verbs are given below: khawa dawa (to eat), nawa khawa (to bath, to eat), thaka khawa (to live and eat), jawa aʃa (to go, to frequent), aʃa jawa (to frequent), lekha pɔʈa (to read and write), pɔʈa lekha (to read and write), pɔʈa ʃona (to read and write) dekha ʃona (to look after), uʈha bɔʃa (to be friendly), dɔa thoa, (giving away), dewa newa (giving and receiving). The two words together are taken as one form and symbolized as Vb. e.g. kheye deye jabe in the above example is Vb (nf) + Vb(f); and dekho ʃano, Vb(f). (See five form verbal forms paradigm piece §3.0.4.

The other types of the two form verbal pieces which are symbolized as Vb + O and Vb + A, are a combination of a non-finite verb plus an operator and a non-finite verb plus an auxiliary verb respectively. The finite verbal form, operator or auxiliary is one of a restricted series of verbs. The verbal piece as a whole behaves like a simple single form verb. In the characteristic utterances of these types of verbal piece in sentences, one major stress is recognized at the beginning of the phrase.

Sentences containing Vb + O types of verbal piece are always in Active constructions and those having Vb + A types of verbal piece are in Passive constructions. Thus,

tomra bɔʃe pɔɽo
(you having seated fall) 'Sit down! '

amar khawa hɔyeche
(my to eat has been) 'I have had my meal'.

3.0.2.2.1. Vb + Operator

In Vb + O types of verbal piece the non-finite verbal form is with any of the non-finite endings -a, -e, -te, -on and -no, and the operator is a finite verb from any one of the verbs listed below. All verbs are given in infinitive forms.

kɔra (to do), bɔʃa (to sit), dhɔra (to catch), pɔɽa (to fall), phela (to drop), dekha (to see), thaka (to live) para (to be able to, can), laga (to cling, to stick), tola (to raise, to lift), pawa (to get), cawa (to want), newa (to take) jawa (to go), dewa (to give), aʃa (to come) ana (to bring,) uṭha (to get up) √ach (stem of the verb 'to be')[1], hɔwa (to be), √gi (stem of the 'to go').[1]

1. Infinitive forms from these stems are not used. See § 3.1.

Verbal forms from all these except √ach and √ja/gi [1] occur within the whole range of the verbal paradigm as the second form in the verbal piece of Vb + O type.

Examples: tomra cɔʈ pɔʈ bɔʃe paṛo
(you quickly having seated fall)

'Sit down quickly'.

3.0.2.2.2 Vb + A(uxiliary)

In Vb + A types of verbal piece the finite verbal form is in the third person, ordinary grade and in all tenses and aspects. The stems of auxiliaries are: √hɔ (stem of the verb 'to be'), √ja/gi (stem of the verb 'to go'), √ach/chi (the stem of the verb 'to be'), √thak (stem of the verb 'to live') √rɔ (stem of the verb 'to live', to stay').

It has already been said that the sentence where a compound verb of the type Vb + A is found is in the Passive construction. Where the auxiliary is formed from the stem hɔ the non-finite verb has -a, -te, -le, -no or -on ending. Where the auxiliary is formed from the stem ja/gi, ach/chi, or thak the non-finite verb has -a, -on or -no ending.

Examples: akaʃer ɔbɔstha bhalo dekha jae
of the sky condition good to see goes

'It is fine weather'.

3.0.3 Three-form verbal piece.

Compound verbal forms: Vb + O + A

Where the sentence is in the Passive construction

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1. These are defective verbs.
See § 3.1.

and the finite verbal piece is composed of three forms, a verb , an operator and an auxiliary in succession the piece as a whole is a three-form Compound verbal form. The final form is any of the auxiliaries mentioned in Vb + A type verbal piece, inflected in third person, ordinary grade in all tenses and aspects. The operator is a non-finite verbal form from the stem of the operators mentioned above in connection with the two-form verbal piece of Vb + O type. The verb (Vb) is a non-finite form from any stem. The first and second form are in similar collocational relation to that of the two-form structure Vb + O, and the second and the third are in a similar collocation to that of the two-form structure Vb + A. Hence the statement made about the formal and syntactical relations of the forms in two-form verbal piece Vb + O and Vb + A will also hold good for the structure Vb + O + A.

Thus:

boikhani eto bhalo je ek niʃʃaʃe pɔɽe
(the book so much good that one breath having read

phela jae
to drop goes). 'The book is so good that one can finish it at a stretch'.

pɔɽe	phela	jae
Vb	O	A

3.0.3.2 Other Three-form verbal piece.

Other three-form verbal pieces are of the type: Vb + Vb + Vb, Vb + Vb + O, Vb + O + Vb, Vb + Vb + A. O or A always forms the second component of a Compound verb.

Thus:

oʈa 'heʈe 'gie 'anbe Vb + Vb + Vb
(that having walked having gone you will bring)

'You will go there on foot and bring that'.

'khele 'bɔʃe pɔɽo Vb + Vb + O
(if you would eat having seated fall)

'Sit down if you would like to have your meal'.

'pɔɽe gie 'kheyo Vb + O + Vb
(having read having gone eat!)

'You will take your meal after you have finished your study'.

boikhani 'pɔɽe 'rakha hɔyeche Vb + Vb + A
(the book having read to keep has been)

'The book was kept after having been read'.

3.0.4 Verbal piece with more than three forms.

Theoretically, though it is possible to have more than five forms in a finite verbal piece, in actual utterances a verbal piece with more than five forms does not usually occur. It has been seen that a three-form verbal piece may be of several combinations: Vb + Vb + Vb, Vb + Vb + O, Vb+ O + Vb, Vb + Vb + A and Vb + O + A. Any one form, Vb or two forms Vb + O may occur before any of the above verbal piece structures.

It is important to note that A(uxiliary) is always found in sentence final position and in sentences whose construction is Passive. O(perator) as a form can occur in any

place not initial in the verbal piece and never occurs without a Vb before it. A detailed statement about the auxiliaries and operators will follow.

It is clear now that the verbal pieces of the type Vb + A, Vb + O and Vb + O + A are treated under the heading of Compound verbs. In traditional grammar books these have generally been explained by such labels as incentives, desideratives, permissives, potentials, continuatives etc. These labels have not been made to present an outline of analysis for the description of such verbal pieces in purely formal and syntactical terms.

The sentences used for the purpose of the present analysis fall under the two main types of sentence structure within which the majority of grammatical relations operate, and in which nominal phrase or phrases and the verbal phrase are considered as occupying first, second and final place, and may be symbolized as N Vb and N_1 N_2 Vb respectively.[1] The verbal piece within the structures has been symbolized as Vb + A, Vb + O, and Vb + O + A. And although a determinative[2] or an emphatic particle may occur within the verbal piece, and

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1. The sentence structure provided and discussed here is only a limited section. But this statement holds good for any two clause or three clause verbal sentence of the N Vb or N_1 N_2 Vb type , and can be extended without any ambiguity to any sentence in colloquial Bengali.
2. A detailed study of 'particles' in Bengali would provide materials for another thesis, hence is outside the scope of this thesis.

although a negative particle[1] may occur within or in the end of the verbal piece, the position of the units should be regarded as fixed.

It may be recalled here, that in an Active sentence construction, the syntactic relation of the concord of person and grade is found between N and Vb in N Vb sentence structure, and between N_1 and Vb in N_1 N_2 Vb sentence structure.[2]

In a passive construction the finite verb is always an auxiliary form and is found in the third person ordinary grade.

Before going into details of the characteristic function of the auxiliaries and operators, I feel it necessary to say a word about the 'defective verbs'[3] and some of the 'particles.'[4]

3.1 Defective verbs

There are certain stems the finite verb-forms of which do not function in regular paradigm of aspect, tense, person and grade as full verbs. These verbs will be called

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1. See infra §. 3.1.5.
2. This is only with ref. to the sentences already cited. But the N piece is not always a one-word piece. Even where the N piece has more than one word, however, the head of the endocentric construction is always statable as N.
3. This will be discussed presently.
4. This thesis aims at dealing with a single word class: verbals. It is seen that in order to provide frame-works in which the verbal forms operate, forms of other word-classes are used in the text. Reference to particles, for instance, is not meant to be exhaustive, and any discussion of their form and function is only introduced to clarify discussion of verbals.

defective verbs.[1]

As non-finite verbs their function is restricted to certain of the set of non-finite endings. Sometimes they function only in sentences of the Active construction. Some of them function in non-command sentences while some others function in Command sentences. That is to say, some verbs have indicative forms but not imperative forms, while others have imperative forms but not indicative forms. Some verbs function in certain tenses and aspects only. Some verbs only occur as non-causative forms and do not occur as causative.

The stems of the defective verbs are listed below:

√‾ach/chi (the stem of the verb 'to be').
√‾ja/gi (" " " " " 'to go').
√‾a/√‾e (" " " " " 'to come').
√‾bɔt (" " " " " 'to be', 'to be sure').
√‾nɔ (" " " " " 'not to be').
√‾ghɔt (" " " " " 'to occur, 'to happen').
√‾cuk (" " " " " 'to complete' 'to settle') and
√‾baʃ (" " " " " 'to feel').

3.1.1. √‾ach/chi (the stem of the verb 'to be', 'to exist').

Indicative finite verbal forms from this stem are found only in Simple Present and Simple Past tenses in the Simple non-Command affirmative sentence in all persons and grades.

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1. The term is not used in the same sense as 'irregular verbs'. See Sutton Page, Introduction to Colloquial Bengali, p.142. See also S.K.Chatterji, Sankhipta Bhāshā Prakāsh Bāngālā Byakaran, 1945, pp.300-302.

Forms of other aspects and tenses are substituted by the corresponding forms of the stem thak, which itself is a full verbal stem functioning in the regular paradigm.

Verbal forms of this stem do not function in the command sentence.[1]

Causative and Non-finite forms are not found from this stem. This does not function in the passive sentence.

Examples:

	Person	Grade		
(i) Simple Present:	1		ami achi	'I am'
	2	F	tui achiʃ	'You are'
	2	O	tumi acho	" "
	2	H	apni achen	" "
	3	O/F	ʃe ache	'He is'
	3	H	tini achen	" "
(ii) Simple Past :	1		ami chilam	'I was'
	2	F	tui chili	'You were'
	2	O	tumi chile	" "
	2	H	apni chilen	" "
	3	O/F	ʃe chilɔ	'He was'
	3	H	tini chilen	" "

1. Forms from the stem 'thak' ('to remain, to live') are substituted for the finite verbal forms of other tenses and aspects, including imperative finites and all causative and non-finite forms.

It should be noted in this connection that these independent finite verbal forms of the stem 'ach/chi' should not be confused with the endings formed from this stem.[1]

Thus,

(a) ami 'bɔʃe 'achi (with stress on both words)
(I having seated am)

'I am seated', and

(b) ami 'bɔʃechi (with a stress on the single nucleus bɔʃ, in which √bɔʃ is the stem and -echi is the ending), (I have sat), 'I have taken my seat'.

In the first sentence 'bɔʃe achi' are two words with two nucleii √bɔʃ and √ach, related together with a non-finite ending in √bɔʃ, and a finite ending in √ach.

In the second sentence 'bɔʃechi' is treated as one word with a single nucleus √bɔʃ as stem and -echi as a finite ending added to it.

(c) ami 'kheye 'chilam (two nucleii) (I, having eaten, was) 'I stayed after the meal'.

(d) ami 'kheyechilam (single nucleus in which √kha is the stem of the verb 'to eat' and -echilam is the finite ending). (I had eaten) 'I ate'.

3.1.2 √ja / √gi (the stems of the verb 'to go').

The finite verbal forms from √ja occur in the Future, Simple and Progressive Present, and Progressive and Habitual Past tenses in all persons and grades.

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1. The evolution of the verb form of the stem ach into the verbal endings for all persons and grades in the Simple Present and Past, and both Progressive and Perfective Present and Past has been historically established. See S.K.Chatterji: O.D.B.L. pp.1035-36. See for endings, § 1.20

The finite verbal forms of other aspects of the rest of the tenses, i.e. perfective present and simple and perfective past tenses in all persons and grades are formed from √gi.

Causative forms, both finite and non-finite, are formed from √ja and never from √gi.

Imperative forms are found always with ~~the~~ √ja and never with √gi.

Non-finite forms in -te, -a, -on and -no endings are found with √ja; non-finite forms in -e, and -le are found with √ja and √gi both.[1]

In sentences of a passive construction, finite and non-finite verbal forms from √ja and √gi occur according as has been mentioned for the finite and non-finite verbal forms in sentences of an active construction; i.e. forms from √ja occur in future, simple and progressive present, and progressive and habitual past tenses, and forms from √gi occur in simple past, perfective present and past tenses.

Examples:

All examples given here are in the first person.

Indicative forms:

Future: ami baɽi jabo 'I shall go home'
(I home shall go)

Simple Present: ami roj iʃkule jai 'I go to school every day'
(I daily to school go)

Progressive present: ami ɖhaka jacchi 'I am going to Dacca'
(I Dacca am going)

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1. The frequency of occurrence is found more with √gi in these endings.

Progressive past: ami dokane jacchilam
(I to .. shop was going)

'I was going to the shop'.

Habitual past: ami roj iʃkule jetam
(I daily to school used to go)

'I used to go to school every day'.

Imperative forms.

Present: iʃkule jao 'go to school! '
(to school go)

3.1.3 √a / √e (the stem of the verb 'to come')

Indicative Finite forms from √e are found only in the simple past tense in all persons and grades.

Only one imperative form in the simple present in the second person Familiar grade is found formed from √a.

Non-finite forms only in -le ending are found from √e.

Causative forms of any kind are not found from these stems. The indicative and imperative forms in all the other aspects , tenses and persons, and non-finite forms in all the other endings (except -le) are substituted by the forms from √aʃ (the stem of the verb 'to come') which itself is a full verbal stem functioning in endings in the regular paradigm in all aspects, tenses, persons and grades.

Forms from √a / √e do not occur in sentences of passive construction.

Examples:

(a) Indicative Forms.

Simple past

Person	Grade			
1	-	ami	elam	'I came '
2	F	tui	eli	'You came '
2	O	tumi	ele	" "
2	H	apni	elen	" "
3	F/O	ʃe	elo	'He came '
3	H	tini	elen	" "

(b) Imperative present:

Person	Grade			
2	F	tui	ae	'come ! '

3.1.4 √bɔʈ (the stem of the verb 'to be sure', 'to be').

Indicative finite verbal forms from this stem function only in the simple present tense in all persons and grades.

No imperative, causative or non-finite forms from this stem are found.

All the indicative finite forms other than forms in the simple present tense and imperative, causative and non-finite forms are substituted by the forms from √hɔ (the stem of the verb 'to be') which itself is a full verbal stem functioning in all aspects, tenses, persons and grades in regular paradigm.

Forms from √bɔʈ do not occur in sentences of passive construction.

Examples:

Simple present

Person	Grade		
1	-	ami chatrɔ bɔʈi (certainly)	'I am a student'
2	F	tui chatrɔ bɔʈiʃ "	'you are a student'
2	O	tumi chatrɔ bɔʈo "	" " " "
2	H	apni chatrɔ bɔʈen "	" " " "
3	F/O	ʃe chatrɔ bɔʈe "	'He is a student'
3	H	tini chatrɔ bɔʈen "	" " " "

Note: The use of the forms of this particular stem (i.e. √bɔʈ) is strictly restricted to the finite forms of simple present tense in a one-unit verbal piece only. Forms from this stem can never function as forming a part of compound verbs of the Vb + A, Vb + O or Vb + O + A pattern. That is to say, a form from this stem does not occur as a non-finite verb with a finite form from any other stem, nor does it function as a finite verbal form in a two-or more-form verbal piece.

The form 'bɔʈe' is a particle and must not be confused with the homophonous verbal form in the ~~habitual~~ simple present in the third person ordinary grade. As a particle the form functions at the sentence final position, i.e. after the finite verbal form in a simple verbal and non-verbal

sentence,[1] which will be clear from the examples given below.

tumi khelechɔ bɔṭe '(certainly) you have played well'
(you have played certainly)

tumi khaṭɔ bɔṭe '(certainly) you work hard'.
(you work (hard) certainly)

tumi chatrɔ bɔṭe '(certainly) you are a student'.
(you student certainly)

All these sentences indicate the response to confirm the point against doubt, taking for granted that there was some shadow of doubt.

Compare also 'tumi chatrɔ bɔṭo' 'certainly you are a student' with 'tumı chatrɔ bɔṭe' 'certainly you are a student'. In the first one 'bɔṭo' is a verb, and in the second 'bɔṭe' is a particle.

The particle 'bɔṭe' is found at the sentence final position in a non-verbal sentence as well. Although this position is normally fixed in the sentence, 'bɔṭe' can also occur in different positions in different phrases in other types of sentence, such as, Compound or Complex sentences.

The particle 'bɔṭe' usually occurs in a phrase final, middle or initial position, sometimes followed by another particle 'kintu' (but).

E.g. tumi eʃecho bɔṭe kintu ami jabɔna
(you have come certainly but I shall not go)

'Yes, you have come, but I am not going'.

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1. The use of these forms - verbal as well as particle is growing obsolete. See S.K.Chatterji: Saṃkhipta Bhāshā Prakāsh Bāṅgālā Byākaraṇ; 1945, p.302,

Note also the peculiar use of 'bɔʈe' at the end of a phrase indicating non-finality of a sentence and the possibility of another phrase initiated by 'kintu'.

E.g. tumi khaʈɔ bəʈe kintu mɔjuri pao na
(you work hard certainly but wages you get not)

'It is true that you work hard but you are not paid well'.

3.1.5 √nɔ (the stem of the verb 'is not' 'not to be')

Indicative finite verbal forms from this stem function only in simple present tense in all persons and grades.

No indicative forms in other tenses and aspects, imperative forms and causative forms occur in Colloquial Bengali.

Non-finite verbal forms from this stem are found only with -le ending.

Forms from √nɔ are not found to occur as a finite verbs in sentences of passive construction.

Examples:

Simple Present indicative forms:

Person	Grade				
1	-	ami (I	bhalɔ good	nɔi am not)	'I am not good'
2	F	tui (you	bhalɔ good	nɔʃ are not)	'You are not good.'
2	O	tumi (you	bhalɔ good	nɔo are not)	" " " "
2	H	apni (you	bhalɔ good	nɔn are not)	" " " "
3	F/O	ʃe (He	bhalɔ good	nɔe is not)	'He is not good'
3	H	tini (He	bhalɔ good	nɔn is not)	" " " "

Non-finite form:

tumi nɔile jao 'You rather go!'
(You if not go!)

It will not be out of place to mention very briefly here the characteristic function of the negative particle. The forms 'na/ne,' 'nai/ nei 'and 'ni' function as negative particles.

The particle 'na 'is found after the finite verbal form in simple past, present and future and present progressive and past habitual tenses in all their aspects in non-command sentences and in only future tense in command sentences.

Particle 'ni ' occurs with finite verbal forms of the simple present. This use of the particle 'ni' with the simple present is found to function as the corresponding negative implications of the perfective present and progressive and perfective past in all aspects and persons and grades.

No negative particles are found with the finite verbal forms of the progressive past nor with the perfective present and perfective past.

Examples:

(i) Non command sentences.

Simple Future ami dekhbɔ na 'I shall not see'.
(I shall see not)

Simple Present ami dekhi na 'I do not see'.
(I see not)

Simple Past ami dekhlam na 'I didnot see'.
(I did see not)

Habitual Past ami dekhtam na 'I was not used to see'.
(I used to see not)

Present Progressive : ami dekhchi na 'I am not seeing'
(I am seeing not)

Past Progressive : ami dekhi ni 'I was not seeing'[1]
(I have not seen)

Present Perfective : ami dekhi ni 'I have not seen'

Past Perfective : ami dekhi ni 'I had not seen'

(ii) Command sentences

Future : tumi dekho na don't see!
(you see not)

With non-finite verbal forms the negative particle na occurs before them.

Thus: ʃe na ele ami jabɔ 'I shall go if he
(he not if comes I shall go) does not come.'

ʃe na aʃte pare 'He may not come.
(he not to come can)

cf. this with ʃe aʃte pare na 'He cannot come'.
(he to come can not)

When the finite verbal form is with -i ending the alternative realization of the negative particle after it is -ne. This alternative pronunciation of na is due to the vowel harmony.

Examples: ami dekhina / ami dekhine 'I do not see'

ami dekhchina / ami dekhehine 'I am not seeing'.

nai, the alternative phonetic realization of which is nei, is found at the end of a non-verbal sentence; or at the

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1. The use of the particle 'na' can also be found at the end of the past progressive tense, but the use is very rare and is not accepted as standard Colloquial style.

end of a verbal sentence in Passive construction where the verbal form is non-finite and is with -a and -te endings.

Examples:

amar taka nai/nei (my money have not)	'I have no money'.
tomar dekha nai/nei (you to see is not)	'You are not seen'.
tomake dekhte nai/nei (to you to see is not)	'You are not to see'.

It is to be noted that the negative particles 'ni', or 'nei', or 'ne' must not be confused with the verbal forms of √ne, (the stem of the verb 'to take') which is a full verbal stem, the verbal forms of which can operate as a full finite verbal form in all aspects, tenses, persons and grades in the regular paradigm, as well as non-finite verbal forms in the non-command and command sentences, and also as causative forms.

In command sentences only the negative particle 'na' occurs after the finite imperative forms in the future tense in order to indicate negative imperative or to prohibit. Thus, dekhona 'don't see! '

'na' is either an emphatic command or an earnest desire, or a polite request or an order form, where it is found after an Imperative form in the Present tense.

Thus: dekhona 'please do see! '
dekhun na 'please do see! '
hok na 'may it be! '

All sentences with a negative particle 'na' are negative sentences. A sentence with an Imperative verbal form

in the present tense where 'na' is not a negative particle is not negative.

Note also that 'na' occurs before an imperative form in third person and present tense in all grades, to indicate negative imperative or prohibition.

Thus:	emon	na	hok	'may it not be so! '
	(such	no	let it be)	
	khoda	na	kɔrun	'God forbid! '
	(God	no	let him	do)

3.1.6 √ghɔṭ (the stem of the verb 'to occur', 'to happen').

Non-causative Indicative finite verbal forms from this stem are found only in the third person ordinary/familiar grade in all aspects, and tenses.

Non-causative Imperative forms are not found from √ghɔṭ.

Causative finite forms, both indicative and imperative, from this stem are found in all tenses, aspects, persons and grades.

Non-finite forms, both causative and non-causative, from this stem are found with endings, -e, -le, -te, -and -no, and are not found with -a and -on endings.[1]

Examples: (3rd person, familiar or ordinary grade).

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1. This is true of a verbal sentence with a finite verbal form in it. Non-finite forms with -a and -on endings, however, occur in non-verbal sentences, e.g. ta ghɔṭa ucit (that to happen, should) 'that should happen'.

Tense.				
Future	Simple :		ta ghɔʈbe (that will happen)	'that will happen'.
Present	"		ta ghɔʈe	'that happens'.
Past	"		ta ghɔʈlo	'that happened'.
"	"	Habitual	ta ghɔʈto	'that used to happen'.
Present		Progressive	ta ghɔʈche	'that is happening'.
Past	"	"	ta ghɔʈchilaʔ	'that was happening'.
Present	"	Perfective	ta ghɔʈeche	'that has happened'.
Past	"	"	ta ghɔʈechilaʔ	'that had happened'.

Non-finite forms:

-e :	ta	ghɔʈe	gelo	'It so happened'.
-le:	ta	ghɔʈle	hɔe	'It is better if it so happens'.
-te:	ta	ghɔʈte	pare	'It may happen'.
-no:	ta	ghɔʈano	hɔbe	'It will be caused to happen'.

3.1.7 (vii) √cuk (the stem of the verb 'to complete', 'to settle')

Like √ghɔʈ indicative finite verbal forms from this stem are found only in the third person ordinary/familiar grade in all aspects and tenses.

Non-causative imperative forms from this stem do not occur.

Both indicative and imperative causative forms from this stem are found in all tenses, aspects, and grades.

Non-finite forms, both causative and non causative, from this stem occur with endings -e, -le, -te, and -ne; but not with endings -a and -on.[1]

Forms from both √ghɔʈ and √cuk occur in the Passive construction.

Examples: (3rd person, Ordinary/Familiar grade).

tense	aspect		
Future		golmal	cukbe
Present	Simple	"	cuke
Past	Simple	"	cuklo
Past	Habitual	"	cukto
Present	Progressive	"	cukche
Past	"	"	cukchile
Present	Perfective	"	cukeche
Past	"	"	cukechilo

Non-finite forms:

-e :	golmal	cuke jabe	'The matter will be settled'
-le:	"	cukle hɔe	'It is better if the matter is settled.'
-te:	"	cukte pare	'The matter may be settled.'
-no:	"	cukano hɔbe	'The matter will be settled.'

3.1.8 √baʃ (the stem of the verb 'to feel')

Forms from the stem 'baʃ 'are always found as forming

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1. Same as for √ghɔʈ, (supra). e.g. golmal cuka bhalo (disturbance settle good). 'It is better that the disorder be settled'.

part of a Compound word with the word 'bhalo' (good) as Prefix. The forms of this stem never collocate with any other word in the language.

Although the forms are never found without the prefix 'bhalo', and although it gives always a compound form to express the translation of the verb 'to love', it is not without any reason that we choose to treat √baʃ (to feel) and not √bhalo baʃ ('to love') as stem.

Firstly, the word 'bhalo' is found functioning as an independent word as a nominal or adjectival form in the language.

Secondly, a verbal stem of this structure (i.e.CVCVCVC) is not found in the whole language, and the multi-syllabic structure is always found in the causative form.

Thirdly, at the phonological level, √baʃ functions in exactly the same way as a CVC stem structure with an open vowel.

Fourthly, in addition to the use with 'bhalo', there existed in the language another form 'manda-baʃa' ('to hate'), in which 'manda' (bad) used to function in exactly the same way as 'bhalo' (good). Forms from 'manda baʃa' are obsolete at present in the standard Colloquial dialect, although it is found in some other dialects.[1] Indicative and imperative finite verbal forms, both causative and non-causative from this stem function as a full verb in all aspects, tenses,

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1. In middle and Old Bengali there are some other forms as well, formed in combination with the a word and the forms of this stem.

persons and grades. Forms from this stem also occur in sentences in the passive construction.

As non-finite forms too, forms from this stem function with all the non-finite endings.

Examples: (First Person).

Future		ami	bhalo-baʃbo	'I will love.'
Present	Simple	ami	bhalo-baʃi	'I love'.
Past	Simple	ami	bhalo baʃlam	'I loved'.
Past	Habitual	ami	bhalo baʃtam	'I used to love.'
Present	Progressive	ami	bhalo baʃchi	'I am loving.'
Past	"	ami	bhalo baʃchilam	'I was loving'.
Present	Perfective	ami	bhalo beʃechi	'I have loved.'
Past	"	ami	bhalo beʃechilam	'I had loved.'

3.2 Auxiliaries : their function, position and meaning.

3.2.0 Auxiliaries are four in number. Their stems are:

√hɑ̄ʔ (the stem of the verb 'to be'),

√ja / √gi (" " " " " 'to go'),

√thak (" " " " " 'to stay', 'to live'),

√ach/ √chi (" " " " " 'to be', 'to have').

Finite forms from these stems function in sentences as auxiliaries or operators in compound verbal forms and as simple independent full verbs.

An auxiliary form is always found as a finite verbal form in the third person, ordinary grade in all tenses and aspects, and occurs only in sentences of passive construction.

An auxiliary form forms part of a compound verb of Vb + A or Vb + O + A structure.

It has already been stated that an operator occurs in sentences of active construction, and is found in all persons, grades, tenses and aspects.[1]

As A in Vb + A and Vb + O + A

3.2.1 √hɔ (the stem of the verb 'to be')

A non-finite form (either Vb in Vb + A or O in Vb + O + A) before auxiliary forms from √hɔ is in -a, -te, -le, -on or -no ending and never with -e ending.[2]

Thus:

tomar ɖhaka jete hɔbe — Vb + A
(your Dacca to go will be.)

'You will have to go to Dacca'.

ekdin chɔbikhana dekhe phelle hɔe — Vb + O + A
(one day the picture having seen if it is)

'Let us see the picture one day'.

3.2.2 √ach/√chi (the stem of the verb 'to be', 'to have')

A non-finite form (Vb in Vb + A or O in Vb + O + A) before an auxiliary form from √ach/√chi is with -a, -on or -no ending.[3]

e kɔtha amar ʃona ache — Vb + A
(this word my to hear is)

'I have heard this'.

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1. Supra
2. See operator below : § 3.3
3. See for other non-finite endings operators from √ach/√chi § 3.3.22

er por make koran pɔɽe ʃonano ache
(after this to mother the Koran having read to make hear is)

Vb + O + A

'After this I have to recite the holy Koran for mother'.

Non-finite forms from this stem are never found.

3.2.3 √ja/√gi (the stem of the verb 'to go')

A non-finite form (Vb in Vb + A or O in Vb + O + A) before auxiliary forms from √ja/√gi is with -a, -on or -no ending.[1]

e cabite amar ghɔr khola jae Vb + A
(this with key my room to open goes)

'You can open my room with this key'.

bɔchɔre ekbar ghɔrkhani khule dekha hɔe Vb + O + A
(in a year once the room having opened to see is)

'The room is opened once a year.

3.2.4 √thak (the stem of the verb 'to stay', 'to live')

A non-finite form (Vb in Vb + A or O in Vb + O + A) before auxiliary forms from √thak is with -a -on or -no endings.[2]

almarigulo khola thak Vb + A
(almiras to open let it remain

'Let the almirahs remain open',

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1. See for the non-finite forms in other endings, operators from √ja/√gi. § 3.3.15.
2. See for other non-finite endings operators from √thak. § 3.3.9

jal khani chorie phela thaklo Vb + O + A
(the net having spread to drop remained)

'The fishing net remained spread'.

3.3 Operators : their function, position and meaning.

3.3.0 It is not possible to describe the function, position and meaning of those words which will be discussed as operators without taking into consideration those features of collocations and usage which bind them to specific forms of certain verbs.

The collocational relationships are illustrated below:

It is to be noted that a number of full verbs occur in the language which have in their finite forms - (i.e. stem +finite ending) identity with the finite forms of certain of the operators.

It should also be noted that the function and meaning of the non-finite verbal forms in -e, -a, -te, -le, etc. do not depend solely on the forms themselves but are also dependent upon the form and function of the operator or the auxiliary or both which follow.

It has been seen that two verbal forms from the same stem do not function as verb and operator.[1] That is to say, collocational usage does not permit the use of two forms Vb + O from the same stem. When two forms from one stem occur successively they are treated as simple verbal forms, and not compound verbal forms. The non finite form in this case usually is with -le ending and in no other ending.[1] Thus

1. √de and √ne are exceptions. See § § 3.3.16 & 3.3.17.

phelle phelbo Vb + Vb
(If I want to throw I shall throw)

'I shall throw it away if I want to'.

gele jao Vb + Vb
(if you want to go go)

'Go! if you want to'

That these two verbal forms are two separate verbal phrases is distinguished by marked stress and intonation. The pause between these forms and the possibility of insertion of some forms of other word classes between them are the formal criteria for distinction. In the case of Vb + O, or Vb + O + A the three forms behave like a single unit verbal piece. The phrase is marked by a major stress on the first form of the whole phrase, and syntactically there is no possibility of insertion of any other form within these two or three forms. This will be illustrated in the following discussion.

Examples are given to show the collocational possibilities of the verbs with a particular operator. A few forms are also listed at the end of the discussion of each operator.[1]

It may also be recalled that a non-finite form before an auxiliary from √ho is with -a, -te, -le, -no or -on ending and a non-finite form before an auxiliary from any of the three √ja/√gi, √ach/√chi and √thak, is with -a, -on or -no ending.

A non-finite form before an operator is with -e, -le, -te or -a ending. A non finite form before a verb of structure Vb + Vb is with any of the non finite endings, -e, -le, -te,

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1. The list is not meant to be exhaustive.

-a, -on, and -no.

Operators : in Vb + O and Vb + O + A structure.

3.3.1 √kɔr (the stem of the verb 'to do')

Where a form from √kɔr is an operator, the non-finite verb before it is with -a or -on ending.

Thus:

ami	tar	ʃãŋe	dekha	kɔri	Vb-a + O
(I	his	with	to see	do)	

'I see him'.

amar	tar	ʃɔŋe	dekha	kɔra	hɔe	Vb-a	+O +A
(My	his	with	to see	to do	is)		

'I see him'.

Below are a few non-finite verbs in -a and -on endings which collocate as Vb plus the finite form from √kɔr as operator.

(i) with -a ending: Vb-a + O√kɔr

khela kɔra (to play), dekhá kɔra (to see),

paka kɔra (to finalize or to settle),

bãka kɔra (to bend), dhawa kɔra (to run after),

nawa kãra (to bathe), etc.

(ii) with -on ending : Vb-ɔn + O√kɔr

lepon kɔra (to smear), lehon kɔra (to lick), palɔn kɔra (to obey), ʃoʃɔn kɔra (to sulk, absorb) etc.

3.3.2 √pɔɽ (the stem of the verb 'to drop', 'to fall').

With a form from √pɔɽ as operator the non-finite verb before it is with -a or -e ending. Some verbs are found

with both -a and -e ending, while some others are either in -a or -e ending only.

tomar nam kaṭa pɔṛbe Vb-a + 0
(your name to cut will fall)

'Your name will be struck off'.

ʃe cɔṭ kɔre keṭe pɔṛlo Vb-e + 0
(he quickly having cut fell)

'He slipped away quickly'.

amra rupʃi iʃṭeʃɔne nebe paṛbo Vb-e + 0
(we Rupshi at station having got down will fall)

'We shall get down at Rupshi Station'.

cor hate nate dhɔra pɔṛe gelo Vb-a +0 + A
(thief to hand to catch having fallen went)

'The thief was caught red-handed'.

Vb -a + Ø/ ̄pa̤ṛ

kaṭa pɔṛa (to slip away, to be struck off), chaṛa pɔṛa (to be deserted, to be let loose), bãdha pɔṛa (to be bound, to be hindered) mara pɔṛa (to die, to suffer), dekha pɔṛa (to be caught), ḍhaka pɔṛa (to be concealed), capa pɔṛa (to be suppressed, to be run over), etc.

Vb -e + Ø/ ̄pɔṛ

kede pɔṛa (to request), bhege pɔṛa (to flee away), keṭe pɔṛa (to slip away), nebe pɔṛa (to get down), lege pɔṛa (to begin), pheṭe pɔṛa (to burst), ḍhuke pɔṛa (to enter), jhule pɔṛa (to swing), cũye pɔṛa (to ooze), ʃuye pɔṛa (to lie), nuye pɔṛa (to bend), bɔʃe pɔṛa (to sit down), eʃe pɔṛa (to come) etc.

Vb -a, -e + Q√pɔɽ

chiɽa pɔɽa (to sprinkle), chiɽe pɔɽa (to slip), ɽheka pɔɽa (to be in difficulty), ɽheke pɔɽa (to be in difficulty, to be stuck), kaɽa pɔɽa (to be struck off), keɽe pɔɽa (to slip away), ghura pɔɽa (to wheel round), ghure pɔɽa (to wheel round) etc.

3.3.3 √mɔr (the stem of the verb 'to die').

The non-finite form before a form from √mɔr as an operator is with -e ending. e.g.

ami khɛɽe mɔri 'I work hard'
(I having worked die)

Vb -e + O√mɔr

kheɽe mɔra (to work hard), khele mɔra (to play hard), kẽde mɔra (to suffer), pɔɽe mɔra (to be involved), likhe mɔra (to be exhausted by constant writing) etc.

3.3.4 √dhɔr (the stem of the verb 'to catch').

The non finite verb before an operator from the stem dhɔr is with -a and -e ending.

O kichudin dhɔre kagɔje lekha dhɔreche
(he for a few days in paper to write has caught)

'He has started writing in the paper for a few days'.

mukh khultei lokgulu oke chẽke dhɔrlo
(mouth on opening the men him having scared caught)

'People caught hold of him as soon as he opened his mouth'.

Vb -a +0 √dhɔr

lekha dhɔra (to start writing), jawa dhɔra (to start going), nɔɽa dhɔra (to start moving), khela dhɔra (to start playing), ʃekha dhɔra (to start learning), etc.

Vb -e +0 √dhɔr

kɔʃe dhɔra (to hold strongly), jɔɽie dhɔra (to embrace), ʈene dhɔra (to hold tight), khule dhɔra (to spread wide open), ʈheʃe dhɔra (to hold tight), etc.

3.3.5 √bɔʃ (the stem of the verb 'to sit').

The non-finite form before an operator from the stem 'bɔʃ' is with -e ending.

tui purono pɔɽa ʃɔb kheye bɔʃechiʃ
(you old to read all having eaten seated)

'You have forgotten all the previous lessons'.

Vb -e +0 √bɔʃ

kheye bɔʃa (to forget, to spoil), gile bɔʃa (to usurp), cepe bɔʃa (to impose, to be a burden), ʈheke bɔʃa (to be hindered), rege bɔʃa (to get angry), bẽke bɔʃa (to be disagreeable) etc.

3.3.6 √par (the stem of the verb 'to be able to', 'can').

The non finite verb before an operator from the stem √par is with -te and -le ending.

tumi gele ekaj hɔte pare
(you if you go this work to be can)

'This could be done if you go'.

ʃe ekbar gie dekhle parto
(he once having gone if he sees could)

'he could go once to see'

Vb -te + 0 √par

hɔte para (to be), dekhte para (to tolerate, to see), jete para (to be able to go), dhɔrte para (to be able to catch), marte para (to be able to beat, kill), khete para (to be able to eat), aʃte para (to be able to come), etc.

Vb -le + Q/√par

dile --(better to give), gele --(better to go), khele --(better to eat). Very few verbs occur as operator with ending -le.[1]

3.3.7 √mar (the stem of the verb 'to kill', 'to beat').

A non-finite verb before an operator from the stem mar has endings -a and -e.

rat dupure tumi dɔrɔjae ʈoka marle
(at midnight you at the door knock beat)

'You knocked at the door at midnight'.

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1. See -le ending: § 3.4.6.
The non finite form from the stem par with -a ending does not collocate with a non-finite form with -le ending before it. Only finite forms from √par are used in this context, e.g. dile parɔ, dile pari, dile pare etc. Hence a dash has been used to denote the absence of non finite form in -a ending, which is roughly equivalent to English infinitive.

Vb -a + 0 √mar

ʈhela mara (to push), jata mara (to press), dhakka mara (to push), guta mara (to push).

Vb -e + 0 √mar

piʈe mara (to beat severely), piʃe mara (to rub severely, to cause suffering), dhamke mara (to keep under threat).

3.3.8 √lag (the stem of the verb ('to stick to', 'to begin' 'to cling')

A non-finite verb before an operator from the stem lag has -te ending.

tar pɔr ʃe kãdte lagle
(after that he to weep began)

'then he started weeping'.

Vb -te + 0 √lag

jete laga (to be going), khete laga (to start eating), dekhte laga (to go on seeing), marte laga (to continue beating), gaite laga (to start singing), pɔʈte laga (to start or to continue reading), etc.

3.3.9 √thak (the stem of the verb 'to stay', 'to remain').

A non-finite form before an operator from the stem 'thak' has -a, -e or -te ending.

beikhani take tola thak
(the book in the shelf to raise let it remain)

'Let the book remain there in the shelf'.

amra prayi ʃekhane gie thaki
(we often there having gone remain)

'We very often go there'.

rat baroṭa ɔbdi meyeṭi poṛte thakbe
(nigh twelve upto the girl to read will be)

'The girl will go on reading up to twelve at night'.

Vb -a + 0 √thak

tola thaka (to remain raised), bãdha thaka (to remain bound), aṭka thaka (to be confined), jana thaka (to become known) etc.

Vb -e + 0 √thak

gie thaka (to go frequently), ghumie thaka (to remain asleep), lege thaka (to stick to), bɔʃe thaka (to remain seated, to sit idle), poṛe thaka (to remain) etc.

Vb -te + 0 √thak

ʃunte thaka (to go on hearing), poṛte thaka (to continue to read), jete thaka (to continue going), kɔrte thaka (to start or to continue doing), likhte thaka (to start or continue writing) etc.

3.3.10 √dãṛa[1] (the stem of the verb 'to stand')

The non-finite verb before an operator from the stem 'dãṛa 'has ending -e.

ʃikkhak aʃamatra amra uṭhe dãṛalam
(the teacher to come only we having raised stood)

'We stood up as soon as the teacher came in'.

1. This is a dissyllabic form. See extended form (C)VCə - § 9.4.4-9.4.5.

Vb -e +0 √dãɽa

phire dãɽano (to stand back), ghure dãɽano (to turn back) ghẽʃe dãɽano (to stand by the side), gie dãɽano (to stop), thɔmke dãɽano (to stop suddenly) etc.

3.3.11 √phel (the stem of the verb 'to throw')

The non-finite verb before an operator from the stem phel has ending -e.

tumi	baɽikhana	kine		phelo	
(you	the house	having	bought	throw)	

'Buy the house'

Vb -e +0 √phel

kine phela (to buy), kɔre phela (to do, to complete), dekhe phela (to happen to see), dhuye phela (to have washed), keʈe phela (to cut), mere phela (to kill, to beat), kẽde phela (to burst into tears), heʃe phela (to laugh), muche phela (to rub) kheye phela (to eat off) chĩɽe phela (to tear off), ʃaɽie phela (to remove), tule phela (to remove) etc.

3.3.12 √dekh (the stem of the verb 'to see')

The non-finite form before an operator from the stem dekh has ending -e.

amʈi		bhari	miʃʈi	kheye		dekho
(the mango		very	sweet	having	eaten	see)

' the mango is very sweet, taste it! '

Vb -e + 0 √dekh

kheye dekha (to taste), gie dekha (to go), kɔre dekha (to take chance), khuje dekha (to search), tule dekha (to have a look), takie dekha (to have a look), nie dekha (to take chance), khele dekha (to attempt to play), ghẽʈe dekha (to search), khɔtie dekha (to take account, to look through) etc.

3.3.13 √tol - (the stem of the verb 'to raise')

Very few verbs function as non-finite in non causative forms where the operators are from the stem 'tol.' The forms from this stem function as operators mainly with the non finite verbs in causative forms. The non finite form has the -e ending.

bɔhu kɔʃʈe ɖeke tollam
(much with difficulty him having called I raised)

'I awakened him with much difficulty'.

Vb -e + 0 √tol

ɖeke tola (to awaken), kɔre tola (to do, to complete), matie tola (to cheer up), jagie tola (to put in motion), khepie tola (to madden, to provoke), ghamie tola (to leave one in difficulty, to perturb), etc.

3.3.14 √pa (the stem of the verb 'to get')

The non finite form before an operator from the stem pa has ending -a or -te.

ɔnekdin tomar dekha paini
(many days your to see I get not)

'I have not seen you for a long time'.

ajo bagane golap dekhte pabe
(today also in garden rose to see you will get)

'Even now you will find some roses in the garden'

Vb -a + 0 √pa

dekha pawa (to see), ʃaɽa pawa (to get response) khola pawa (to find open, to find easy), etc.

Vb -te 0 √pa

dekhte pawa (to be able to see), miʃte pawa (to have chance to mix), khete pawa (to have something to eat), bɔʃte pawa (to be able to sit, to be allowed) etc.

3.3.15 √ja / √gi (the stems of the verb 'to go')

The non finite forms before an operator from √jā/ √gi have -e ending.

e bhabe khɔrɔc kɔrle dudinei pɔther
(in this way spend if one does in two days of the street

bhikhiri hɔe jabe
(beggar having been will go.)

'If he goes on spending like this, he will be a street beggar within a short time'.

Vb -e + 0 √ja/ √gi

hɔe jawa (to become), dhɔre jawa (to burn, to stop), uɽhe jawa (to go away), bɔdlie jawa (to get changed), kheɽe jawa (to go on working), pɔɽe jawa (to go on reading), pɔɽe jawa (to drop, to fall), gulie jawa (to get forgotten),

harie jawa (to get lost), palie jawa (to flee away, to abscond), die jawa (to give), likhe jawa (to write, to continue to write), me jawa (to take) chuṭe jawa (to rush, to run quickly) etc.

3.3.16 √de (the stem of the verb 'to give')

The non-finite forms before an operator from √de have ending -a, -e or -te.

rani bɔchɔre ækbar dækha den
(quin in a year once to see gives)

'The queen comes to the view once a year'.

rakhal gɔruduṭo ekʃathe juṛe dilo
(shepherd the two cows in one with making pair gave)

'The servant put the two cows together'.

oke ekhane keno aʃte dao
(him here why to come give)

'Why do you allow him to come here?'

Vb -a + 0 √de

khawa dæwa (to throw a party), dekha dæwa (to come to the view), capa dæwa (to suppress), jata dæwa (to press), haṭa dæwa (to start walking), chiṭa dæwa (to spread, to spray), ṭheka dæwa (to give support), ṭhæla dæwa (to push), dela dæwa (to swing), tola dæwa (to raise).

Vb -e + 0 √de

chuṛe dæwa (to throw), ɖheke dæwa (to cover), keṭe dæwa (to cut), rekhe dæwa (to keep), mere dæwa (to beat, to win), cheṛe dæwa (to leave), ɖhele dæwa (to pour), ṭhele dæwa (to push), phele dæwa (to throw away), tule dæwa (to remove, to shift), ʋṭhie dæwa (to abolish), ṭhɔkie dæwa (to cheat),

die dæwa (to give).[1]

Vb -te + 0 √ de

aʃte dæwa (to allow), ɖhukte dæwa (to allow entrance), thakte dæwa (to let live, to leave), mɔrte dæwa (to let one die), khelte dæwa (to allow to play), pɔɽte dæwa (to send to school), bɔʃte dæwa (to offer seat).

3.3.17 √ ne (the stem of the verb 'to take')

The non-finite forms before an operator from √ ne have ending -e or -te.

ora naite gieche; cɔlɔ amra e ɔbʃɔre
(they to bathe have gone go we this free time

kheye ni.
(having eaten take.)

'They have gone to take a bath, let us have our meal in the meantime.'

eimatrɔ amra khete niechi
(this moment we to eat have taken)

'We have just started eating'.

Vb -e + 0 √ ne

kheye næwa (to eat), nie næwa (to take), keɽe næwa (to cut, to deduct), jeye næwa (to have gone), tule næwa (to take away), keɽe næwa (to snatch away), khaɽie næwa (to get one work), ceye næwa (to want), ɽuke næwa (to note down), ene næwa (to collect), dekhe næwa (to see (threat)), nie næwa (to take) etc.[2]

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1. This verb takes as its non-finite verb before it from the same stem. takaɽa 'die dao' (pay the money).
2. This verb takes as its non-finite verb before it from the same stem takaɽa 'nie nao' (take the money).

Vb -te + 0 √ne

bɔʃte næwa (to attempt to sit), uʈhte næwa (to attempt to get up), ɖhukte næwa (to attempt to enter), khelte næwa (to allow to play), etc.

3.3.18 √aʃ (the stem of the verb 'to come')

The non-finite forms before an operator from √aʃ have -e ending.

amra ʃɔmɔy mɔto cɔle aʃbo
(we time according to having started shall come)

'We shall come in time'.

Vb -e + 0 √aʃ

cɔle aʃa (to come), uʈhe aʃa (to come away), dhɔre aʃa (to begin to burn, to stop), dekhe aʃa (to see), kheye aʃa (to eat), phurie aʃa (to be exhausted), kɔme aʃa (to lessen), nie aʃa (to bring), rekhe aʃa (to leave), cheɽe aʃa (to leave) etc.

3.3.19 √an (the stem of the verb 'to bring')

The non-finite form before an operator from the stem an has -e ending.

0 ʃɔb - bæpar guchie eneche
(he all affairs having winded brought)

'he has arranged everything'.

Vb -e + 0 √an

tule ana (to bring out), uʈhie ana (to pick out) cine ana (to choose out), guʈie ana (to wind up), guchie ana (to arrange), ceye ana (to beg), etc.

3.3.20 √ʊʈh (the stem of the verb 'to get up')

The non-finite form before an operator from the stem ʊʈh has -e or -te ending.

ami na janiei gie ʊʈhlam
(I not having informed having gone got up)

'I went (there) without information.'

nao ebar khete ʊʈha
(take now to eat get up)

'Well, come and have your meal now'.

Vb -e + 0 √ʊʈh

gie ʊʈha (to complete journey, to reach), ʃere ʊʈha (to recover), kheye ʊʈha (to finish eating), bɔle ʊʈha (to start speaking), geye ʊʈha (to start singing), die ʊʈha (to complete giving), ʃune ʊʈha (to be able to hear), jɔle ʊʈha (to burn out, to be furious), kaʈie ʊʈha (to escape), kɔre ʊʈha (to be able to complete). etc.

3.3.21 √hɔ (the stem of the verb 'to be')

The non-finite verb before an operator from √hɔ has -a (or in causative form -no) ending.

ami tomar jɔnne bhebe bhebe
(I for you having thought having thought

ʃara hɔi
finish am)

'I am much worried for you'.

Vb -a + 0 √hɔ

ʃara hɔwa (to be exhausted), paka hɔwa (to be mature, to be confirmed), dekha hɔwa (to be seen, to meet). etc.

3.3.22 √ach / √chi (the stem of the verb 'to be')[1]

The non-finite verb before an operator from √ach / √chi has -a or -e ending.

ami	maʃchɔek		bɔʃa	achi
(I	about six months		to sit	am)

'I am unemployed for about six months'.

tumi	kar	jɔnne	bɔʃe		ache
(you	whose	for	having	seated	are)

'Who are you waiting for?'

Vb -a + 0 √ach / √chi

bɔʃa -- (to be unemployed), laga -- (to continue to cling), jaga -- (to remain awake), etc.

Vb -e + 0 √ach/chi[2]

bɔʃe -- (to wait), jege -- (to be awake), mete -- (to be absorbed), bhule -- (to forget), ɖube -- (to be occupied), ʃue -- (to lie down), jɔme -- (to be frozen), pɔɽe -- (to be left behind, to lie down), ceye -- (to look forward), etc.

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1. See 'defective verb', § 3.1.1.
2. Non-finite forms are not found from the stem ach/chi. For all non-finite and other finite verbs than Simple Present and Past, forms from √ thak (the stem of the verb 'to remain') are substituted. See § 3.1.1.
   There is no form from stem 'ach' equivalent to English, infinitive 'to be'. A dash is used in place of * 'acha', which is a theoretical form.
   See S.K.Chatterji, O.D.B.L., pp. 1035-36.

3.4 The function, position and meaning of the non-finites:

3.4.0 The function, position and meaning of an auxiliary and an operator in a sentence have already been stated. In this section the function of non-finite forms as a whole with different non-finite endings will be very briefly discussed.

It has been seen that the verb in Vb + O, Vb + A, and Vb + O + A structure has certain non finite endings, and O in Vb + O + A has certain non-finite endings. It is also to be noted that non-finite endings alone can not define and determine function or meaning of any non finite verb, operator or auxiliary. It is the whole piece that is to be taken into consideration. Contextual[1] and Collocational[2] function are of major importance in describing any function or meaning of a non-finite or a finite verbal form or both. In determining an operator or an auxiliary it has been seen that certain forms collocate with certain forms, while certain others do not, and that certain non-finite forms have certain endings while certain others have quite different endings. The different function of different non-finite forms with different endings will be made clear in the following discussion.

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1. See J. R. Firth, "The Technique of Semantics", T.P.S., 1935, pp. 55-67.
   C.K.Ogden and I.A.Richards, The Meaning of Meaning, London, 1952.
   C.K.Ogden and Malinowski, The Problem of Meaning in Primitive Languages (Supplement I), London, 1949, pp.296-336
   B. Malinowski, Coral Gardens and Their Magic, Vol.II, An Ethnographic Theory of Language, pp.3-74.
2. See J.R.Firth, "Modes of Meaning", Essays and Studies, (The English Association), 1951.

Non-finite endings: -a, -on, -no, -e, -te and -le.[1]

A non-finite form with ending -a and -on is non-causative. With -no it is causative. Forms in endings -e, -te and -le can be either non-causative or causative.

3.4.1 Ending -a

A non-finite verbal form (Vb in Vb + A, Vb or O or both in Vb + O + A) with -a ending functions in sentences in passive construction, and (Vb in Vb + Vb, or Vb + O) in sentences in active construction. When, however, more than one form is found in succession with -a ending they are treated as one single unit as a whole termed, double-form.[2]

Examples:

	ami	tar	ʃɔŋe	dekha	kɔri	'I see him'	Vb + O
-a+ ..	(I	his	with	to see	do)		
	amar	tar	ʃɔŋe	dekha	hɔe	'I see him'	Vb + A
-a+ ..	(my	his	with	to see	is)		
	amake	dekha	dite	hɔe		'I have to be seen'	
-te+ ..	(me	to see	to give	is)		Vb + O + A	
-a+-a+..	ami	take	dekha	ʃuna	kɔri	'I take care of him'	
(double)	(I	him	to see	to hear	do)	Vb + O	
-a+-a	ami	lekha	pɔɽa	kɔrte	cai	'I want to study'	
(double)	(I	to write	to read	to do	want)	Vb + O + Vb	

---

1. There are also two endings, -ba, and -bar which has the characteristic feature of taking a particle with them in all sentence type. So they are better treated as a special case. On formal grounds they can be treated as compound particles and not as non-finite endings. See Ch. I. foot note on P. 31.
2. See Ch. I foot note on p. 49.

3.4.2 Ending -on

The function of a non-finite form with -on ending is similar to that of a form with ending -a. The form may be Vb in Vb + A, Vb + O and Vb + O + A and O in Vb + O + A. In Vb + O + A structure where one (Vb or O) is with -on ending, the other verbal form can have any of the non-finite endings.

If two forms are in -on ending they are treated as a 'double form.' (supra)

Examples: (same as for -a)[1]

It should be noted that the verbal form with endings -a, -on and -no may be represented by what is known as infinitives in English, e.g. jawa or jaon, 'to go'; kɔron, 'to do' jawano 'to cause to go', kɔrano 'to cause to do' etc. And that a form with endings -a, -on or -no as the main verb usually takes a form from √kɔr or √hɔ as operators.

3.4.3 Ending -no

The use of the verbal forms in -no ending is very limited collocationally. It is found only with causative forms. A non-finite verbal form with -no ending functions exactly the same manner as a non-causative non-finite form with a ending, subject to the limitation of collocation. The non-finite verb before or after a form with -no ending has any non-finite ending.

Examples:

-no+.. amake ta dekhano hɔe 'That is shown to me'
(me that to show is) Vb A

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1. Forms with -on ending are specially used in dialects. See M.A.Hai, Nasals and Nasalization in Bengali., Dacca University, 1960

- no + .. take oʃud khawano dhari N Vb + O
(him medicine to cause to eat I catch)

'I cause him to take medicine'

-e + no + .. oke khaṭie newano hɔe
(him having caused to work to cause to take is)
Vb + O + A

'He is made to work hard'

-no +-le + .. oʃud meʃano thakle hɔe Vb +O +A
(medicine to cause to mix if remain is)

'It is better if the medicine is mixed'

-no+ te +.. oʃud meʃano thakte hɔe Vb +O + A
(medicine to cause to mix to remain is)

'The medicine should be mixed'

3.4.4 -e

Non-finite verbs with -e ending occurs only as Vb in Vb + O structure. Vb may be preceded by several non finite verbal forms with -te, le and -a. A form with ending -e is never found as Vb in Vb + A structure nor as O in Vb + O + A structure.[1] Verbal form with -e in Vbof Vb + O or Vb +O + A structure may be represented by 'ing' form in English, e.g. nie eʃo (having brought come!) 'bring along! '

-e + ... amṭa kheye phelo Vb + O
(the mango having eaten drop) 'eat the mango'

- e + ... take mere phelle Vb +O
(him having killed drop) 'you are killing him'

- e + ... ekɔtha bɔle bɔʃechi Vb +O
(this word having said I have seated) Vb +O

'I said this (uncautiously)'

---

1. Except when O in Vb + O + A is from √hɔ.

-te+ -e take dekhte pere uṭhlam . $\frac{Vb}{Vb + O} + O$
(him to see having been able raised)

'I managed to see him'.

-a + -e ʃe boka kheye jae $\frac{Vb}{Vb + O} + O$
(he to rebuke having eaten goes)

'He is rebuked'.

-te+e+e ami uṭhte gie poṛe jai
(I to get up having gone having fallen go)

'I fall down when I try to get up'. $\frac{Vb}{Vb + O} + \frac{Vb}{Vb + O}$

When Vb is preceded by a form with -le ending it is found to be a different pattern. This point will be discussed with -le.[1]

Note that the main verb with -e ending usually takes a form from √kɔr and √hɔ as operatives.[2]

In Vb + O structure endings -e, -a, -te, -le are possible with Vb.

In Vb + A all the endings except -e are possible in Vb. i.e. a form with ending -e is not possible as Vb in Vb + A.

Just as in Vb + A so also in Vb + O + A, a form with ending -e is not possible as O. That is, in a sentence of passive construction a form immediately before the auxiliary (Vb, in Vb + A, or O in Vb + O + A) can never have -e ending.

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1. Note also the particles with -e : bɔle, kɔe, bɔṭe, hɔe, etc.
2. See § 3.3.1 and 3.3.21.

3.4.5 -te

Non-finite verbs with -te ending occurs as Vb in all three structures; viz. Vb + A, Vb + O, and Vb + O + A and also as O in Vb + O + A.

A non finite Vb in -te ending may be followed by several other non-finite verbal forms with endings -a, -e, -te and -le.

Vb in Vb + O + A with -te ending may be followed by any operator with any of the non-finite endings, except ending -e; and O in Vb + O + A with -te may be preceeded by any verb with any of the non-finite endings except -le, (subject to the approval of the collocational usage).

Examples:

-te + - . ami dekhte pari 'I can see' Vb + O
(I to see can)

-te + - amar dekhte hɔe 'I have to see' Vb + A
(my to see is)

e+-te + .. amake bɔʃe pɔɽte hɔe Vb + O + A
(to me having seated to fall is) 'I have to sit down'

-te +le +.. ami oke dekhte parle hɔe Vb + O + A
(I him to see if I can is) 'It is enough if I can see him'

-e+te+ - - ami bəʃe pɔɽte pari Vb + O +Vb
(I having seated to drop can) 'I can sit down'

-te + -e . (Not possible)

-te + -te + amake bəlte dite hɔe Vb + O + A
(me to say to give is) 'I have to allow to speak' or 'I have to be allowed to speak'

-te+ -le+ take ʃəmɐe mɐtɐ dhɐrte parle hɔe
(him time according to to catch if can is)
Vb + O + A

'(I doubt) if (you) can catch him in time'.

-a +-te + amar dekha kɔrte hɔe Vb + O + A
(my to see to do is)

'I have to meet'

-e+ -te+ amake uʈhe pɔɽte hɔe Vb + O + A
(to me having got up to fall is)

'I have to get up'

le+ -te+ (Not possible)

Vb can not have -e ending in Vb + O + A structure where the non-finite verb O is with -e ending; and a verb as O can not have -e ending in Vb + O + A structure where the Vb is with -le ending.

Vb and O in this structure can have any other non finite ending.

3.4.6 -le

Non-finite verbs with -le ending occurs as Vb in all three structures, viz. Vb + O, Vb + A, and Vb + O + A and also as O in Vb + O + A.

In Vb + O, Vb with -le may be preceded by several other non-finite verbal forms with endings -a, -e, -te, but not with ending -le. When, however, two verbal forms occur with ending -le, they are found to be two different Vbs, or a double form.

In Vb + O + A structure a form with -le occurs as operator when Vb is found in -a, -e, -te.

Where the Vb form is with -le the operator can have any of the non-finite endings except -e.

In a three-form verb piece where the first Vb form is with ending -le and the second is with ending -te, -le, -a, the first form is an independent non finite Vb and the second and the third together form a Vb + A structure;[1] and where the second form has -te, -le, -e, the first form is an independent non-finite Vb and the second and the third together form a Vb + O structure, and Vb in Vb + O and Vb + A behave in the same manner as in the case of two form verbal piece of these structures.[2]

Examples:

-le + .. ami dekhle pari — Vb + O
(I if I see I can)

'I may have a look'

- le + .. jaegaṭa dekhle hɔe — Vb + A
(the place if one sees is)

'The place may be visited'

-le+a+ .. khælaṭi dekhle para jae — Vb +Vb + A
(the game if one sees to be able goes)

'The game can be seen'

-a+-le+ .. ami kal bikele tar ʃɔŋe dekha dile
(I tomorrow evening his with to see if one

pari — Vb
gives I can) — Vb + O + O

'I'd better see him tomorrow evening'

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1. That this is a different verb is recognized by the intonation and also by the pause, and by the possibility of inserting a particle or nominal form in between them.
2. Note: a non-finite form with -e ending occurs as Vb in Vb + O, and with -a ending occurs as Vb in Vb + A. (Supra)

-e+-le+..kagəjkani dekhe dile pari
(the paper having seen if one gives I can)
Vb
Vb + O + O

'I can well go through the paper'

-te+-le+.boi khani tomake dekhte dile pari
(the book to you to see if one gives I can)
Vb
Vb + O + O

'I'd better give you the book to go through'

-le + -le(double)+.. cheleguluke dekhle ʃunle
(at the children if one sees if one hears

paro
you can) Vb + O

'You can look after the children'

-le + -le(double)+.. ekhəno lekhle pəɽle
(even now if one writes if one reads

pariʃ
you can) Vb + O

'even now you can study'

-a+-le+ .. ʈini aj dekha dile hɔe Vb + O + A
(he today to see if he gives is)

'(I doubt) if he allows visitors today'

-e+-le+.. laəkhaʈi dekhe dile hɔe
(the piece of writing having seen if one gives is
Vb + O+ A

'I can see the paper'

-te+-le +.. laəkhaʈi dekhte dile hɔe
(the paper to see if one gives is)

'Better to give the paper to see'

-le+ -e+.. jhɔrnaʈa dekhle dekhe jao
(the fountain if you see having seen go) Vb+ Vb+ O

'You can see the fountain if you like'

-le+-a+. jhɔrnaʈa dekhle dekha jae
(the fountain if one sees to see goes) Vb + Vb + A

'The fountain might be visited'.

-le+-te+ jhɔrnaʈa dekhle dekhte pari
(the fountain if one sees to see I can) Vb + Vb + O

'I may see the fountain'.

-le+-le(double)+cheleguluke dekhle ʃunle pari
(the children if one sees if one hears I can)
Vb + O

'I may look after the children'.

-le+-te+ .. khele khete hɔe Vb + Vb + A
(if one eats to eat is)

'You must have your meal if you want to'.

PART TWO

CHAPTER 4 Texts

CHAPTER 5 Vowel articulations

CHAPTER 6 Consonantal Articulations

CHAPTER 4

Texts

4.0 General Outline.

4.1 Orthography.

4.2 Transliteration.

4.3 Phonetic Transcription.

4.4 Phonological Notation.

4.2 Transliteration.

4.2.0 General Outline.

4.2.1 Vowel characters.

4.2.2 Consonant characters.

4.2.3 Inherent vowel and həsəntə

4.2.4 Medial and final vowels.

4.2.5 ənusvar.

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4.5 Other Notations.

4.6 Translation.

CHAPTER 4

TEXTS

4.0 The Phonetic and phonological analyses have been separately marked by the use of a separate notation in each case.

Four different notations have been used in this thesis[1]. They are:

1. Orthography,
2. Transliteration,
3. Phonetic transcription and
4. Phonological notations.

4.1 In Bengali as in other languages[2] with a long literary tradition behind them, spelling and pronunciation are often not in accord.

4.2 The transliteration is an augmented romanized version of the spelling in the original characters, using consistently one letter or group of letters for each character of the Bengali alphabet.

4.3 In the phonetic transcription, the sounds of Bengali words are sought to be consistently represented by means of I. P. A notations, with a few exceptions, e.g. ć , j and y. In I. P. A. c and j represent palatal plosives and palatal

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2. See J.R. Firth: 'Phonological features of some Indian languages.' Proceedings of the Second International Congress of Phonetic Sciences, 1935, pp. 176-177.

1. There is again another notation : Reading transcription which neither transliteration nor phonetic but in between them. see p. 114.

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fricative respectively, whereas, I have used them for palato alveolar voiceless and voiced affricates. y has been used for I.P.A. j. It may be noted that even the phonetic transcription, however narrow it might be, does not record actual speech events in any sense, but makes observations of certain features of a speech and symbolizes them in symbols whose values depend on the particular sets of relations, in which they are used.[1]

a stands for a neutral open vowel neither front nor back.

The phonetic transcription is given in square brackets to distinguish it from the systematic roman transliteration.

4.4. Phonological notation has been explained in the course of the thesis and need not be detailed here.

4.2.0 Transliteration

The roman letters used in this thesis for transliterating Bengali characters are the same as those used by H.M. Lambert in her 'Introduction to the Devanagari script' with some modifications and additions.[2]

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1. Ibid.
2. H.M.Lambert (Introduction to the Devanagari Script, Oxford University Press, 1953. pp. 173-231) adopted the All India Roman Alphabet system with some modifications and additions.

For comparison, the roman letters of the transliteration system used in the linguistic survey of India[1] have also been shown by the side of the corresponding Bengali characters.

In quoting the titles of books and in citations from Bengali AIR transliteration has been used. Diacriticals have not always been used with proper names which are usually spelt without them.

4.2.1 Vowel Characters

Bengali Character		A.I.R.Transliteration.	L.S.I.Transliteration.	Symbol used.
Initial vowels.	Vowel signs.			
অ		ə	a	ə
আ	া	a	ā	a
ই	ি	i	i	i
ঈ	ী	ii	ī	ii
উ	ু	u	u	u
ঊ	ূ	uu	ū	uu
ঋ	ৃ	r	ri̥	r[2]
এ	ে	e	ē	e
ঐ	ৈ	əy	ai	əi
ও	ো	o	ō	o
ঔ	ৌ	əw	au	əu

1. Linguistic Survey of India, edited by Sir George Greaṙson. Specially see vol. V, Part.I, p.27.
2. Syllabic r 'occurs only in some Sanskrit loanwords'. See Lambert, op.cit, p.176

4.2.2 Consonant Characters

Bengali Character	A.I.R.Transliteration.	L.S.I.Transliteration.	Symbol used.
ক	kə	ka	kə
খ	khə	kha	khə
গ	gə	ga	gə
ঘ	ghə	gha	ghə
ঙ	ŋə	na	ŋə
চ	cə	cha	cə
ছ	chə	chha	chə
জ	jə	ja	jə
ঝ	jhə	jha	jhə
ঞ	ɲə	ña	ɲə
ট	ṭə	ṭa	ṭə
ঠ	ṭhə	ṭha	ṭhə
ড	ḍə	ḍa	ḍə
ঢ	ḍhə	ḍha	ḍhə
ণ	ṇə	ṇa	ṇə
ত	tə	ta	tə
থ	thə	tha	thə
দ	də	da	də
ধ	dhə	dha	dhə
ন	nə	na	nə
প	pə	pa	pə
ফ	phə	pha	phə
ব	bə	ba	bə

Bengali Character	A.I.R. Transliteration	L.S.I. Transliteration	Symbol used.
ভ	bhə	bha	bhə
ম	mə	ma	mə
য	yə	ya(ja)	yə
র	rə	ra	rə
ল	lə	la	lə
ব	və	va(ba)	bə
শ	ʃə	śa	ʃə
ষ	ʂə	sha	ʂə
স	sə	sa	sə
হ	hə	ha	hə
ড়	ɽə	ṛa	ɽə
ঢ়	ɽhə	ṛha	ɽhə
ঁ	́yə	ya	́yə
ং	ŋ	ṁ	ŋ
ঃ	ɦ	ḥ	ɦ
ঁ	~	~	~

4.2.3 Each consonant character of the Bengali script represents a syllable consisting either of a vowel or of a consonant followed by the first vowel of the vowel series. This vowel is usually referred to as the inherent vowel.[1] In referring to a consonant character of the Bengali syllabary,

1. The term 'inherent' is from English traditional grammars and used here for transcriptional purpose only.

the inherent vowel is represented by ə, the phonetic notation of which maybe represented by I.P.A. symbol [ɔ], e.g. বকə bəkə [bɔk] 'rebuke'.

When, however, an inherent অ ə is not implied, it is indicated by the sign ্ həsəntə [1] below the consonant. Thus ক্ k and not kə, ম্ m and not mə. The consonant ত t without a following vowel is represented by the sign ৎ khanda tə.

The character য yə is referred to as antastha jə, to distinguish it from জ jə, referred to as vargiya jə. The semi vowel য় is referred to as antastha yə and is represented in Bengali by a modified form of the character with a dot below it.

The character ব və is referred to as antastha bə, to distinguish it from bə referred to as vargiya bə. This character is only found in ~~only~~ Sanskrit loan words.

4.2.4 Vowel characters are written in Bengali to represent syllables consisting of a vowel only, and vowel signs are added to consonant characters to represent syllables consisting of an initial consonant followed by one of the vowels in the series.

It has been said that the vowel অ ə is the

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1. Sanskrit term 'halanta' 'ending in a consonant'.

inherent vowel of each of the consonant characters in the form in which they are given in the syllabary. It has no corresponding vowel sign. Vowel signs, corresponding to the other vowel characters are given below added to the consonant character ক kə.

কা	কি	কী	কু	কূ
ka	ki	kii	ku	kun
কৃ	কে	কৈ	কো	কৌ
kr	ke	kəi	ko	kəu

Special forms of some of the characters with vowel signs:

গু	রু	রূ	শু	হু	হৃ
gu	ru	ruu	śu	hu	hr

4.2.5 The signs [1] ঁ ং and ঁ are marks added to characters to represent some modification of the syllable it represents. The ং anusvarə and the ঁ cəndrəbindu represent nasalisation. The sign ənusvarə ং is written to the right of a character. The vowel of the syllable which the character represents is nasalized. In the transliteration of examples, in roman letters, the ənusvarə is transcribed as ঙ where two alternative spellings ŋ and ং are used. ŋ will be used for transliteration.

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1. Lambert calls them 'modifiers'. See her book 'Introduction to the Devanagari Script'. p. 204.

ənusvarə added to vowels and the consonant character

অং আং ইং ঈং উং ঊং এং ঐং

əŋ aŋ iŋ iiŋ uŋ uuŋ eŋ əiŋ

ওং ঔং

oŋ əuŋ

কং কাং কিং কীং কুং কূং কেং কৈং

kəŋ kaŋ kiŋ kiiŋ kuŋ kuuŋ keŋ kəiŋ

কোং কৌং

koŋ kəuŋ

4.2.6 The mark ঁ cəndrəbindu is written above a character, the vowel of the syllable which the character represents is nasalized. In transliteration the sign ~ is written above the corresponding letter. Cəndrəbindu added to characters:

অঁ আঁ ইঁ ঈঁ উঁ ঊঁ এঁ ঐঁ ওঁ ঔঁ

ə̃ ã ĩ ĩi ũ ũu ẽ əĩ õ əũ

cəndrəbindu added to consonant character ক kə with vowel signs:

কঁ কাঁ কিঁ কীঁ কুঁ কূঁ কেঁ কৈঁ কোঁ কৌঁ

kə̃ kã kĩ kĩi kũ kũu kẽ kəĩ kõ kəũ

4.2.7 The sign visərgə ঃ is written to the right of a character. This represents the voiced glottal fricative. In the transcription of examples, in roman letters, the sign ঃ 'visərgə' is transcribed as h̨ (with a ̨ below the h) in order to distinguish it from uṣmə h হ . visərgə added to vowels and the consonant character ক kə.

অঃ আঃ ইঃ ঈঃ উঃ ঊঃ এঃ ঐঃ ওঃ

əh̨ ah̨ ih̨ iih̨ uh̨ uuh̨ eh̨ ə͡ih̨ oh̨

ঔঃ

ə͡uh̨

কঃ কাঃ কিঃ কীঃ কুঃ কূঃ কেঃ কৈঃ

kəh̨ kah̨ kih̨ kiih̨ kuh̨ kuuh̨ keh̨ kə͡ih̨

কোঃ কৌঃ

koh̨ kə͡uh̨

The signs ənusvarə and visərgə ং ঃ are also written with the inherent vowel ə preceeding. Thus ং is written as əṃ and ঃ is written as əh̨. This may be compared with ঙ and হ which are written as ŋə and hə respectively.

A set of examples is given below:

অজ আম্র ইট ঈদ

əjə (goat) amə (mango) iṭə (brick) iidə (name of a festival)

উট ঊন ঋণ

uṭə (camel) ũnə (less) rṇə (debt)

এক ঐরাবত ওল

ekə (one) əirabətə (elephant) olə (name of a vegetable)

ঔষধ কলম খাল

əuṣ ədhə (medicine) kələmə (pen) khalə (canal)

গাল ঘ্রাম রঙ্

galə (cheek) ghərmə (house) rəŋ (colour)

4.2.8 'Consonant characters may be combined to represent two or more consonants which are to be realized consecutively, without an intervening vowel. Characters formed in this way are referred to in Bengali as yuktakṣərə.'[1]

A ' yuktakṣərə ' is transliterated in roman letters by a group of letters. Thus পাল্টা ও paltao, পস্তা ও pəstao etc. In the transliteration the inherent vowel is written after a group of consonant letters under the same condition as after a single consonant letter.[2] e.g. জব্দ jɔbdə , and অস্ত astə.

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1. Lambert, op.cit. Chapter 3, p.208.
2. For details, See Lambert, op.cit. Bengali Section, Ch.3.

4.5 Other notations

All punctuation marks are used as in English. e.g.

, : comma,

; : semi-colon,

. : full stop,

- : dash,

- : hyphen,

? : Note of interrogation,

! : Note of exclamation,

' ' : Inverted commas,

( ) : Round Brackets,

[ ] : Square Brackets.

Word for word renderings of English have been put within round brackets ( ),[1] and idiomatic English translation within inverted commas ' '.[1] Square brackets have consistently been used for phonetic transcription.[2]

The reading transcription is only used in Part One and is neither strictly phonetic, nor is it the regular roman transliteration but between the two.[3]

I have chosen this reading transcription because it enables the reader to identify the forms I am drawing attention to more easily than either of the other two would, by comparison with the same examples written in the Bengali orthography.

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1. Infra.
2. Supra.
3. See Chapter 1, footnote 1. p. 15

In the orthography the full stop is marked by an upright stroke of the same height as the upright stroke of a character, which is called দাঁড়ি dāṛi.

4.6 Translation.

Word for word renderings have been given within round brackets in order that the forms or phrases be recognized, and then idiomatic English translations are given. It should be clearly understood that the meaning of a sentence is determined by the context of situation in which it is used by the participants.[1] So in translating Bengali sentences into English I have always kept in view the context of culture in which they are used.

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1. See, J.R.Firth, The Technique of Semantics, T.P.S., 1935. pp.55 - 67.
   C.K. Ogden and I.A. Richards, The Meaning of Meaning, London, 1952.
   C.K.Ogden and B. Malinowski, The Problem of Meaning in Primitive Languages, (Supplement I) London, 1949, pp. 291-336.
   B. Malinowski, Coral Gardens and Their Magic, Vol.II, An Ethnographic Theory of Language, pp. 3-74.

CHAPTER 5

Bengali Vowel Articulations

5.0 General Outline

5.1 Simple vowel articulations

5.1.0 General outline

5.1.1 [i]

5.1.2 [e]

5.1.3 [æ]

5.1.4 [a]

5.1.5 [ɔ]

5.1.6 [o]

5.1.7 [u]

5.2 Diphthongal articulations

5.2.0 General outline

5.2.1 [ii]

5.2.2 [ei]

5.2.3 [ai]

5.2.4 [oi]

5.2.5 [ui]

5.2.6 [æe]

5.2.7 [ae]

5.2.8 [ɔe]

5.2.9	[oe]
5.2.10	[æo]
5.2.11	[ao]
5.2.12	[ɔo]
5.2.13	[oo]
5.2.14	[ou]
5.2.15	[au]
5.3	Nasalization of vowels in Bengali verbal forms.
5.3.0	General outline.
5.3.1	'cəndrəbindu'
5.3.2	Notation ˜
5.3.3	
5.3.4	'ənunaʃikə'
5.3.5	Nasal and non-nasal pronunciation.
5.3.6	Nasalization of vowels due to the proximity of nasal consonants.
5.3.7	Nasality: a prosodic element.
5.4	Duration.
5.4.0	General outline.
5.4.1	Various contexts of vowel-length.
5.4.2	Length and shortness of vowels.
5.4.3	Phonetic notation.

CHAPTER 5

Bengali Vowel Articulations

5.0 In this section the vowel sounds of Bengali have been described in general phonetic terms and are symbolized in terms of the I.P.A. chart.

This discussion is divided into two sub-sections: simple vowel articulations and diphthongal articulations.

5.1 Simple vowel articulations

5.1.0 A comprehensive description of the vowel qualities in Bengali is not desired. A few typical monosyllabic and dissyllabic one word verbal sentences are selected for examples. Approximate tongue positions of the respective vowels are shown in a vowel diagram with reference to my pronunciation of the forms which are chosen from the whole range of the verbal scatter.

5.1.1 [i] represents a front unrounded vowel between close and half close. The height of the tongue is between close, and half-close, the front part of the tongue is highest, the lips are spread or neutral, the opening between the jaws is narrow. e.g. [piṭa] 'to beat', [piṭi] 'I beat'.

5.1.2 [e] represents a front unrounded vowel between half-close and half open. The height of the tongue is between

half-close and half-open, the front of the tongue is raised, the lips are slightly spread or neutral, the opening between the jaws is medium. e.g. [peɽa] (alternative pronunciation of [piɽa]), 'to beat', [kheli] 'I play'.

5.1.3 [æ] represents a front unrounded vowel between half-open and open. The height of the tongue is between half-open and open and the front of the tongue is raised, the lips are slightly spread or neutral, the opening between the jaws is medium. e.g. [khæla] 'to play'.

5.1.4 [a] represents an unrounded open vowel but neither front nor back. The height of the tongue is open, back of the front of the tongue is highest, the lips are neutral, the opening between the jaws is medium to wide. e.g. [kaɽa] 'to cut', [kaɽi] 'I cut'.

5.1.5 [ɔ] represents a back rounded vowel between half open and open. The height of the tongue is between open and half-open, the back of the tongue is highest, the lips are rounded, the opening between the jaws is medium. [bɔla] 'to say'.

5.1.6 [o] represents a back rounded vowel between half-close and half-open. The height of the tongue is between half-close and half-open, the back of the tongue is highest, the

lips are rounded, the opening between the jaws is medium. e.g. [boli] 'I say', [tole] 'he raises'

5.1.7 [u] represents a back rounded vowel between close and half-close. The height of the tongue is between close and half-close, the back of the tongue is highest, the lips are rounded, the opening between the jaws is narrow. e.g. [tuli] 'I raise'

The total number of vowel symbols is seven. They are [i], [e], [æ], [a], [ɔ], [o], and [u].

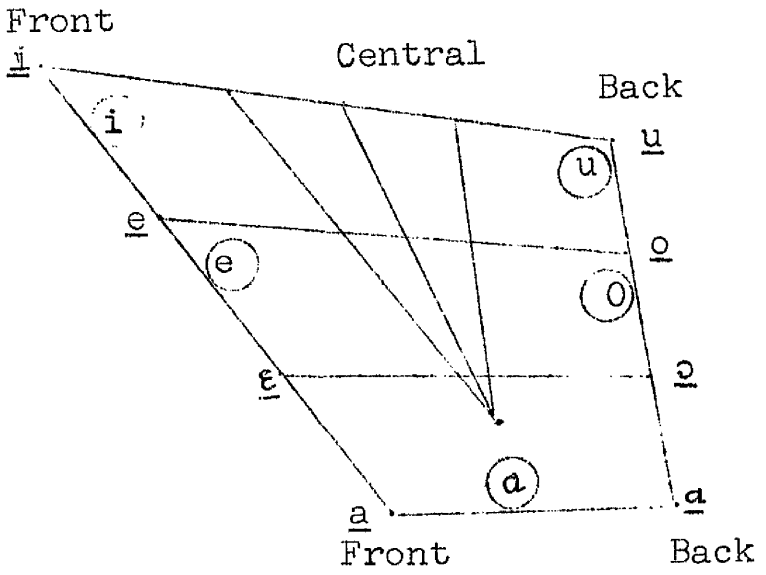
Forms with different endings have different vocalic qualities in the stem syllables.[1]

Diagram I[2] ~~will~~ shows the approximate tongue position of the vowels in the stem syllables of the forms in [-i] ending: [piṭi], [kheli], [kaṭi], [boli], [tuli]; and diagram II ~~will~~ shows the approximate tongue position of the vowels in the stem syllables of the forms in [-a] ending: [piṭa] [peṭa], [khæla], [kaṭa], [bɔla], [tola].

The cardinal vowels are underlined, Bengali vowels are shown in circles.

1. See for details Chapter 10.
2. See the diagram illustrating the tongue positions of Cardinal vowels: Daniel Jones, An English Pronouncing Dictionary (11th edition), frontispiece.

I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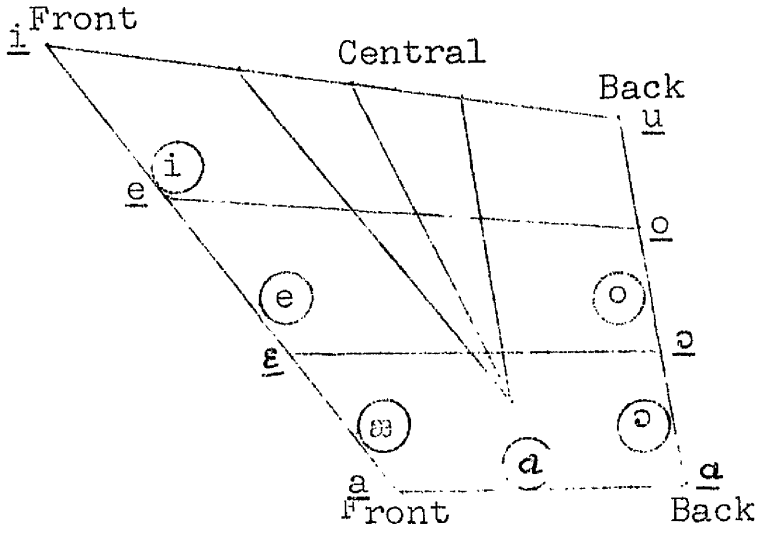
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Text:

1. [ami take roj ɑkbar piʈi]
(I him daily once beat)

'I give him a beating every day'.

2. [amra bikele kheli]
(we in the evening play)

'We play in the evening!

3. [ami nijhate gachʈi kaʈi]
(I by ~~won~~ hand the tree cut)

'I cut the tree down myself'.

4. [ʃono, gɔlpoʈa abar boli]
(listen the story again I tell)

'listen, I shall tell the story again'.

5. [amiito oke ʃokale ɖeke tuli]
(It is me him in the morning having called raise)

'I am the one who wakes him up in the morning'.

6. [oke ɔmon kore peʈa ucit hɔeni]
(him such having done to beat proper is not)

'It was not right to beat him so hard'.

7. [rode khæla ʈhikna]
(in the sun to play right not)

'It is not good to play in the sun'.

8. [bhõta kaste die ki dhan kaʈa jae?]
(blunt sickle with what rice to cut goes)

'You can not reap rice with a blunt sickle! '

9. [ki hobe kichui bɔla jaena]
(what will be anything to say goes not)

'No one can say what will happen'.

10. [tomar ghɔrkhani dokkhinmukho tola ucit chilo]
(you the house southfacing to build proper was)

'You should have built the house facing south'.

5.2 Diphthongal articulations

5.2.0 For the purposes of the verbal forms the term diphthong is justified at the phonetic level [1] and is not required at other levels, because with the possible exception of ~~the~~ a few forms, diphthongs are [2]

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1. So far as I know, the diphthongs in Bengali have not been discussed at the structural level. Dr. S.K.Chatterji enumerates 25 diphthongs in Bengali. They are: iɐ, ia, io, iu; ei, ea, eo, eu; æe, æo; ai, ae, ao, au; ɔe, ɔa, ɔo; oi, oe, oa, ou; ui, ue, ua, uo. (See, "A Bengali phonetic Reader',.... p.20, § 48-50 and also O.D.B.L.
M.A.Hai (see his article on 'bangla svaradhveni o dhvenir byabya-hare' in 'Shahitya Patrika', winter number, 2nd vol. 1365 B.S., Published by the author, from the Dept. of Bengali, University of Dacca.) gave an exhaustive list of 30 diphthongs in Bengali. Among them 18 are 'regular' and 12 'irregular'. They are : (a) ii, iu, ei, eo, eu, æo, æy, ai, ao, au, ay, ɔo, ɔy, oo, ou, oi, oy, ui; (b) ia, ie, io, ea, eo, æa, ɔa, oa, oe, ue, ua, uo.
All these are stated at only the phonetic level. No statements have been made about the system at the structural level within any grammatical category.

2. These are [toula], [douɽa], [põucha], [ʈhaoɽano], [auʈano] and [aoɽano]

observed only in a sequence where ə and ə V or two Vs occur adjacently. These sequences occur only within a single verbal form [1] whose stem final is a V or ə, and the ending begins with a V.

Thus, [ai] in [khai] and [kaṭai] is a diphthong in articulation. The morphological division of stem and ending of the forms respectively is [kha-] + [-i] and [kaṭa-] + [-i]. The phonological structure of the two forms are CV-V and CVCə-V respectively.

At the phonological level, therefore, two elements -VV or -əV will be set up for all diphthongs in a verbal form. But at that level every -VV or -əV sequence is not phonetically a diphthong. For example, for [-ie] in [die] and [kaṭie] -VV and -əV are stated but the phonetic expression of the sequence [-ie] in both the forms is not diphthongal in articulation.

At the phonological level a phonetic diphthong in a verbal form is different from a phonetic diphthong in other

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1. Interword -VV or -əV sequences either in two verbal forms occurring adjacently, or a verbal form and any other form coming before or after it, do not express a diphthongal articulation.
   Thus in [tumi khete eʃo] 'come down to take your meal final [-e] in [khete] which is a verbal form, forms the first part of the sequence and [e-] in [eʃo] which is another verbal form, forms the second part of the sequence [-ee-]; and in [tumi ḍhaka eʃo] 'come to Dacca' [-a] in [ḍhaka] which is a nominal form, constitutes the first part and [e-] in [eʃo] which is a verbal form, constitutes the second part of the sequence [-ae-]. Neither of these two sequences [-ee-] and [-ae-] is a diphthong in articulation.

word classes. Thus, for the diphthongal articulation [-oi] in [boi] 'a book', which is a nominal form or [oi] 'that' which is a particle, a V is stated.[1]

In phonological formulae a -VV or -əV sequence in two morphologically different structures, i.e. stem and ending will be shown with a hyphen in between. Thus, [khae] will be shown as CV-V.

The total number of diphthongs found in Bengali verbal forms is fifteen. They are represented by the following symbols: [ii], [ei], [ai], [oi], [ui]; [æe], [ae], [au], [ɔe], [oe], [æo], [ao], [ɔo], [oo]; and [ou].[2]

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1. Different statements about the diphthongs in other word classes than verbal forms will be necessary. It is neither possible, nor desirable to make an overall statement about the V system in different word classes, as is evident from the examples cited.

   'Though the vowel qualities in nominal forms may be phonetically similar to those in verbal forms, the terms of the "V" systems require separate phonological statement. The "V" system set up on the basis of the maximum commutation in paradigms of verb forms do not hold good for the "V" systems of nominal structures or those of other grammatical categories established for the particular 'restricted language' of Bengali under description'. - J.R.Firth. Foreword: in M.A.Hai's A phonetic and phonological study of Nasals and Nasalization in Bengali, p.iv.

2. [ou] as a phonetic diphthong falls in the same class as the others, but a different statement will be made at the phonological level.(see Footnote 2. p.123) ~~mention also [ao] of [aoɾano] and [aoʈano]~~.

   Besides these 15 diphthongs enumerated here, there may occur with some speakers in 'rapid style' the following diphthongs in Bengali verbal forms: [ie] as in [die], [io] as in [dio], [eo] as in [kheo], [ue] as in [ʃue]; [oa] as [ʃowa], [æa] as in [dæa],[uo] as in [ʃuo]. In my usual pronunciation they are not found as diphthongs, but two vowels.

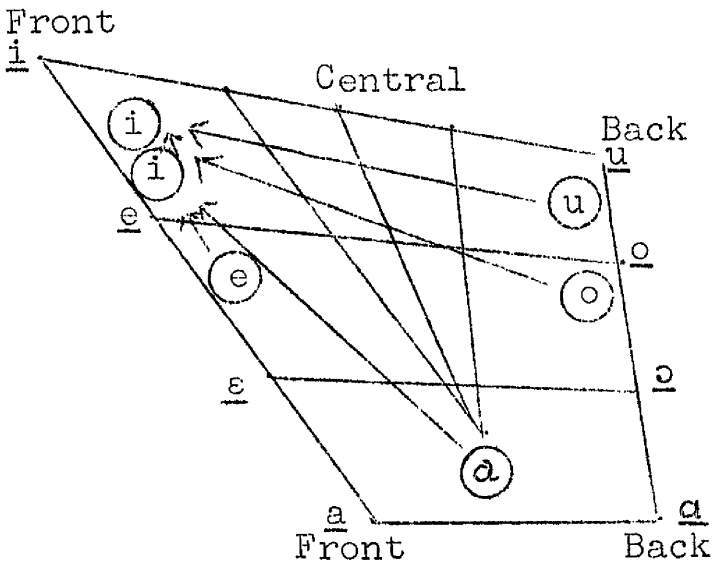
5.2.1 [ii] represents a diphthong in the articulation of which the tongue starts from a rather close front vowel [i] and moves in the direction of a close front vowel. e.g. [dii] 'I give', [nii] 'I take'.

5.2.2 [ei] represents a diphthong in the articulation of which the tongue starts from the position of a front vowel somewhere between a half-open and a half-close vowel and moves in the direction of a close front vowel [i]. e.g. [dei] 'I give' (alternative pronunciation of [dii]. [nei] 'I take' (alternative pronunciation of [nii].

5.2.3 [ai] represents a diphthong in the articulation of which the tongue starts from the position of an open vowel midway between front and back, and moves in the direction of a close front vowel [i]. e.g. [khai] 'I eat', [pai] 'I get'.

5.2.4 [oi] represents a diphthong in the articulation of which the tongue starts from a vowel position somewhere between a half-open and a half-close rounded back vowel and moves in the direction of a close front vowel [i]. e.g. [boi] 'I bear'.

5.2.5 [ui] represents a diphthong in the articulation of which the tongue starts from the position of a close back vowel and moves in the direction of a close front vowel [i]. e.g. [ʃui] 'I sleep'.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Text

1. [ami roj take œkʈi kore ʈaka dii]
(I daily him one with rupee give)

'I pay him a rupee every day!

2. [tomader laibreri-theke ami maʃe dukhana
(your library - from I every month two

boi nei]
book take)

'I borrow two books every month from your library'

3. [amra dine œkbar khai]
(We in a day once eat)

'We have one meal a day!

4. [ami tomar boier bojha boi]
(I your of book burden carry)

'I always have to carry your books!

5. [ami dɔʃʈar pɔre ʃui]
(I of ten after go to bed)

'I don't go to bed until after ten!

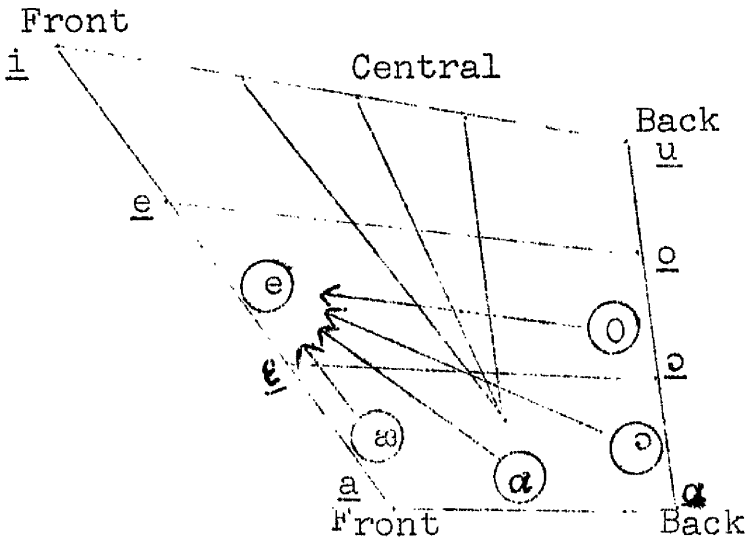
5.2.6. [œe] represents a diphthong in the articulation of which the tongue starts from the position of a front vowel somewhere between open and half-open and moves in the direction of a front vowel between half-open and half-close. e.g [dœe] 'he gives', [nœe] 'he takes'.

5.2.7 [ae] represents a diphthong in the articulation of which the tongue starts from the position of an open vowel

half-way between front and back and moves in the direction of a front vowel between half-open and half-close. e.g. [khae] 'he eats', [pae], he gets'.

5.2.8 [ɔe] represents a diphthong in the articulation of which the tongue starts from the position of a rounded back vowel between open and half-open and moves in the direction of a front vowel between half-open and half-close. e.g. [bɔe] 'he bears'.

5.2.9 [oe] represents a diphthong in the articulation of which the tongue starts from the position of a rounded back vowel between half-open and half-close and moves in the direction of a front vowel between half-open and half-close. e.g. [ʃoe] 'he sleeps'.



Text

1. [tarik chele bhalo, o roj alike kichu khabar dæe]
   (Traik boy good he daily to Ali some food gives)

   'Tarik is a good boy, every day he gives Ali some of his food!

2. [ora gorib, ja pae tai khae]
   (They poor whatever get that eat)

   'They are poor, they eat whatever they can get'.

3. [bhaggɔhiner bojha ke bɔe ?]
   (of unfortunate burden who bear)

   'Who carries the burden of unfortunate?!

   'Who is to look after the poor?!

4. [ʃe derite ʃoe]
   (he late goes to bed)

   'He goes to bed late!.

5.2.10 [æo] represents a diphthong in the articulation of which the tongue starts from the position of a front vowel between open and half-open and moves in the direction of a rounded back vowel between half-open and half-close.

e.g. [dæo] 'you give', 'give!'

[næo] 'you take', 'take!'

5.2.11 [ao] represents a diphthong in the articulation of which the tongue starts from the position of an open vowel between front and back and moves in the direction of a rounded back vowel between half-open and half-close.

e.g. [khao] 'you eat', 'eat!'

[pao] 'you get', 'get!'

5.2.12 [ɔo] represents a diphthong in the articulation of which the tongue starts from the position of a rounded back vowel between open and half-open and moves in the direction of a rounded back vowel between half-open and half-close.

e.g. [bɔo] 'you bear', 'bear!'

5.2.13 [oo] represents a diphthong in the articulation of which the tongue starts from the position of a rounded back vowel between half-open and half-close and moves in the direction of a rounded back vowel between half-open and half-close.

e.g. [ʃoo] 'you sleep', 'sleep!'

'The closing sound of the diphthong [oo] in [ʃoo] is closer than the initiating one'.[1]

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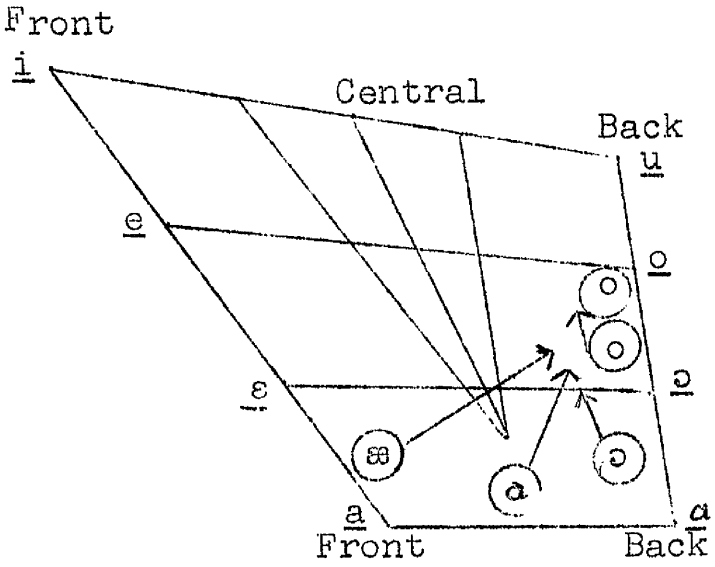
1. See M.A.Hai, 'A phonetic and phonological study of Nasals and Nasalization in Bengali', 1960, University of Dacca, p.67.



Text

1. [təslim baba, oi kɔlomʈa dæo ar ei boikhani næo]
(taslim father that the pen give and this the book take)

'Taslim, dear, give me that pen and take this book! '

2. [tumito kichui khelena, mi ʂ ʈiʈa aro ekʈu khao]
(you something ate not the sweet and also a little eat)

'You have hardly eaten anything; have a little more sweet'.

3. [ɔnorthɔk kæno bojhaʈa bɔo]
(Without meaning why the burden you carry).

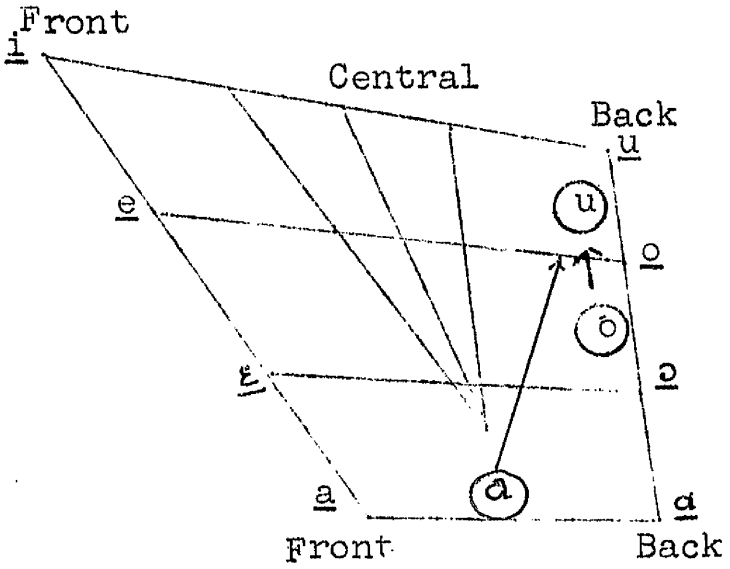
'Why do you put up with it?.'

4. [kɔbita ma ɔnek rat hɔeche ebar ʃoo]
(kabita mother much night has become now go to bed)

'Kabita, dear, it is late, go to bed now'. '

5.2.14 [ou] represents a diphthong in the articulation of which the tongue starts from the position of a rounded back vowel between half-open and half-close and moves in the direction of a rounded close back vowel [u]. e.g. [douɽa] 'run!'

5.2.15. [au] represents a diphthong in the articulation of which the tongue starts from the position of a neutral open vowel between front and back and moves in the direction of a rounded close back vowel [u] e.g. [auɽio] 'stir while boiling'.



Text. [ranna hoe] gele duttɽa auɽio]
1. (cooking having been gone the milk stir)
'Warm the milk after you have finished cooking'.

2. [loktɽar pechone douɽa]
(of the man behind run)

'run after that man'.

5.3 Nasalization of vowels in Bengali verbal forms

5.3.0 In the articulation of the vowels that have been described above, the soft palate is raised and the nasal passage is thus closed with the result that no air can pass through it. This closure of the nasal passage is designated

'velic closure'.[1] If, however, there is no velic nor velar closure and the soft palate is lowered, the air can escape through both the nose and the mouth. The vowels that are pronounced in this way with the combined resonances of the nose and the mouth, are said to be nasalized.

5.3.1 In Bengali orthography a nasalized vowel is symbolized with a 'candrabindu' (moon-dot) placed over the vowel itself where there is no consonant preceding it and over the consonant to which the vowel is affixed.

5.3.2 In our notation, the nasalized forms have been represented by the I.P.A. symbol ~ placed over the symbol of the sound which is nasalized. e.g. [kãpe] 'he trembles', [khõɽe] 'he digs'.

5.3.3 All Bengali vowels are subject to nasalization process.[2] The nasalized forms are called 'anunasika' (accompanied by nasality) as distinguished from 'anusvara' (nasal-after-sound) which includes consonantal nasals. For the articulation of the nasals there must be a closure in the oral cavity along with the lowering of the soft palate. The choice of the point at which the closure occurs makes the

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1. In contrast to velar closure, see K.L.Pike, Phonetics, p.58
2. O.D.B.L. p.267.

difference between a bilabial [m], alveolar [n], velar [ŋ] and other nasal sounds.[1]

5.3.4 'ənusvarə' does not occur in Bengali verbal forms except in a very few verbs. e.g. [bhaŋ], 'break!' [bhəŋca], 'make faces at'. etc.[2]

5.3.5 Unlike certain other modern Indian languages,[3] such as Urdu, Hindi or Gujerati, nasalization in Bengali does not

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1. The 'ənunasikə' or nasalized vowel differs from the 'ənusvarə' or nasal after sounds in the following respects: (i) The 'ənusvarə' nasal after-sound is equivalent to a vowel plus one of the nasal alternants ŋ, ɲ , ɳ, n, ɔ or m necessitating a definite closure at some point in the oral cavity.
(ii) The ənusvarə nasalizes the immediately preceding vowel, e.g. [roŋ], 'colour', [baŋla] 'Bengali'. This nasalized vowel combined with the nasality accompanying the oral closure for the nasal after-sound makes the nasal component of the ənusvarə much greater in extent than that of a nasalized vowel (ənunasikə). e.g. [baŋla] 'Bengali', [bãka] 'to bend', [bãca] 'to live'.
(iii) The ənusvarə has the effect of imparting to the following voiced consonant a simultaneous homorganic nasal component (*) which accompanies or covers the whole of the voicing component, so that we have only a weak plosive release owing to the opening of the nasal passage throughout the period of the occlusion. In the case of the voiceless plosives, however, the nasal component accompanies only a portion of the closure.
(*) For simultaneous components, see Z.S. Harris, Simultaneous components in Phonology, Language, vol.20, No.4. Oct.-Dec. 1944, pp.181 - 245).
2. See § 6.2
3. See, Firth's remarks on 'marathi' in this respect:
'In the matter of the nasalization difference in vowels, marathi is a special case. It has nothing like the functional importance of nasalization in Urdu, Hindi, or Gujerati.'
— Firth, 'Phonological Features of some Indian Languages', The Proceeding of the second International Congress of Phonetic Sciences, 1935.
See also, B.N. Prasad, A Phonetic and Phonological Study of Bhojpuri, thesis submitted for the Degree of Ph.D., University of London, 1950.

distinguish one word from another. e.g. [haʃa], [hãʃa], 'to laugh'. Both the forms, one with nasalized vowel and another without it, are used as variants without causing any semantic difference. There are, however, about a hundred verbs written in the orthography with the 'cəndrəbindu', which are pronounced either with a nasalized vowel or with an oral vowel.

5.3.6 Nasalized vowels are also found in forms which include nasal consonants. In Bengali orthography there is no extra convention to indicate this nasalization of a vowel, which is due to the proximity of a nasal consonant.

Nasalization of a vowel due to its contact with a preceding or following nasal consonant is usually not as strong as the characteristic nasal tamber of independent nasalization of a vowel, i.e. without there being any nasal consonant before or after it.[1]

Nasalization of a vowel preceded and followed by nas nasal consonants, e.g. [a] in [man] 'obey!' is usually as strong as an independent nasal vowel, e.g. [ã] in [kãpe] 'he

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1. M.A.Hai suggests the same. See Nasals and Nasalization in Bengali, pp.120-121. ss 134-137.
Dr. C. Ferguson and Munier Chowdhury, in an illuminating article entitled 'The Phonemes of Bengali', observe: The phonemic nasality of the S C B nasal vowels is relatively weak and at times may even be a kind of breathiness rather than nasality in the strict sense. Accordingly, it sometimes happens that the nasal quality of a phonemically oral vowel next to a nasal consonant is more striking phonetically than the nasal quality of a phonemically nasal vowel. (The phonemes of Bengali, s 5; Language, 36, 1. 1960. p. 37)
My kymograph tracings appear to support Hai's statement.

shivers'. See kms. of [kãpe], 'he shivers' (No.1) [nace] 'he dances' (No.2), [ʈane] 'he pulls' (No.3), [manɸ] 'he obeys' (No.4).

A nasal element with simultaneous aspiration[1] is also a significant feature in some Bengali verbal forms. Forms with initial aspirated consonant followed by a nasalized vowel, or with initial aspirated nasalized vowel exhibit simultaneous components of aspiration and nasalization.[2] e.g. [ghãʈe] 'he stirs' and [hãʃe] 'he laughs'.

5.3.7 For phonological purposes, nasality is dealt with as a prosodic element of structure. In doing so the prosodic approach advocated by J.R.Firth, is applied.[3]

The following examples will illustrate Bengali verbal forms with nasalized vowel.

[ã] - [kãpe] 'he shivers', [bãce] 'he lives', [rãdhe] 'he cooks', [ãke] 'he draws'.

[ĩ] [bĩdhɳ] 'I prick', [chĩɽi] 'I tear'.

[ẽ] [khẽci] 'I pull', [phẽki] 'I throw' [ʃẽki] 'I bake'.

[ãə] [khãəca] 'to pull' [ʃãəka] 'to bake'.

[õ] [ʃõpa] 'to entrust'.

[õ] [gõja] 'to thrust'.

[ũ] [khũɽi] 'I dig', [phũki] 'I blow (with mouth)'.

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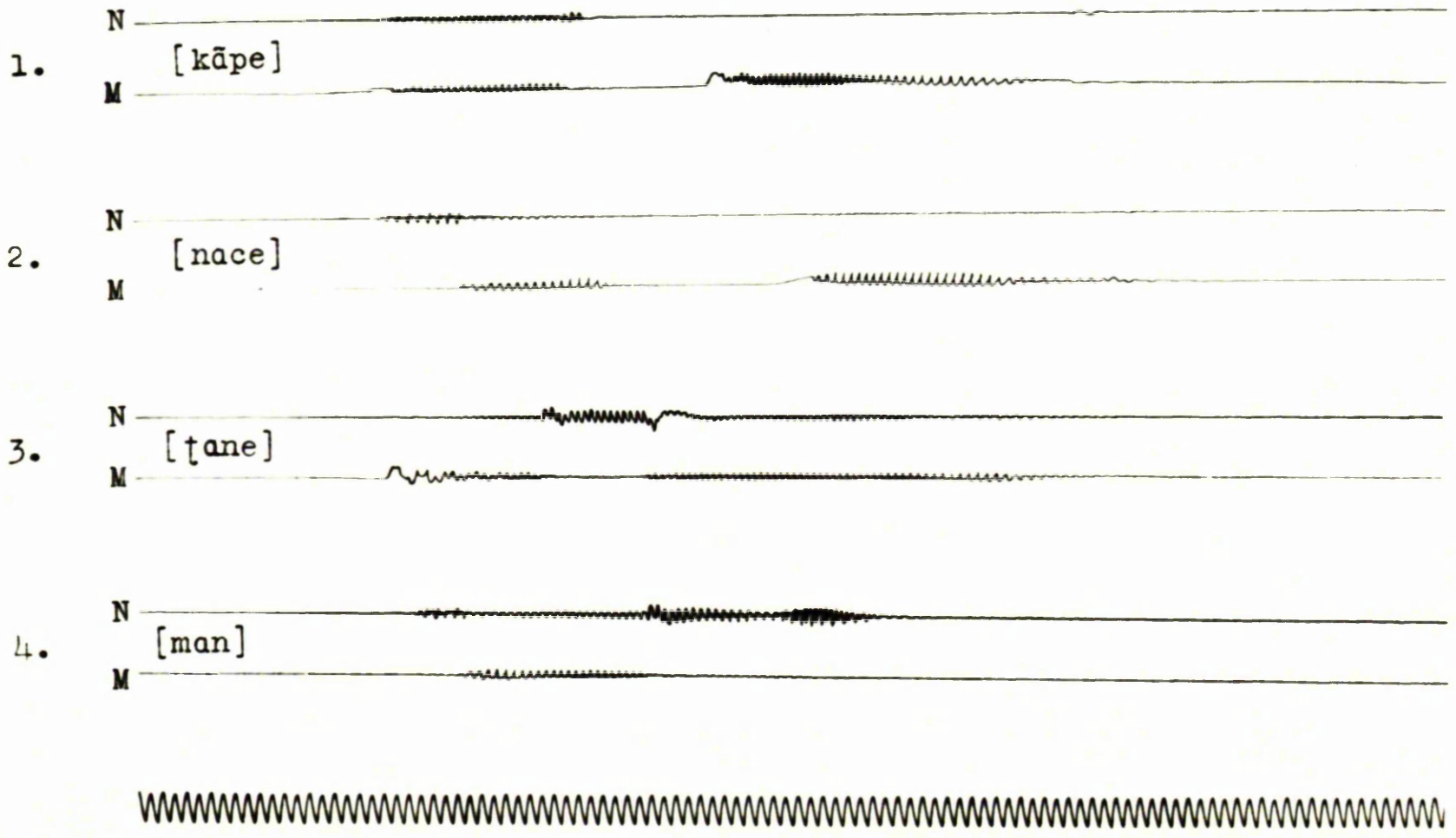
1. For simultaneous components see Z.S. Harris, 'Simultaneous Components in Phonology'. Language, 20, 4, 1944. pp.187-245.
2. See J.R.Firth, Introduction to Harley's Colloquial Hindustani p.XVI, 'on the combination of nasalization and aspiration'.
3. J.R.Firth, 'Sounds and Prosodies', T.P.S. 1948.


1.
N
[kāpe]
M
2.
N
[nace]
M
3.
N
[ţane]
M
4.
N
[man]
M

Text:	[pani	ar	bataʃ	chaɽa	keu	ki	bãce]
	(water	and	air	without	anyone	what	lives)

'No one can live without water and air'.

5.4 Duration.

5.4.0 Words of similar structure in Bengali may be differentiated by reference to several features or by reference to a single feature. In this latter case the differentiation may, for instance, be by different items in the consonant system or by different items in the vowel system. It may also be by the presence or absence of nasality, or by the presence or absence of aspiration, or by the presence or absence of voicing. Differentiation of words in this way does not include differentiation in terms of vowel length. In colloquial Bengali there are no 'pairs' of vowels, long and short. "The quantity of Bengali vowels depends on the ~~rhythm~~ rhythm of the sense group."[1] At the phonological level therefore, quantity in terms of shortness and length will not be stated.

5.4.1 Although length is not distinctive, the measurable duration of a particular vowel in its various phonetic contexts varies according to the contexts themselves.

5.4.2 It has been observed that usually the vowel of a monosyllabic form pronounced in isolation, and the final vowel of a polysyllabic form are longer in duration than the

1. S. K. Chatterji, 'A Bengali Phonetic Reader', § 52.

other vowels in polysyllabic form.[1]

This can be seen in Km. tracings of [pa], 'get!' 'you get it!' (No.5), [pat] 'spread' (no.6), [pate] 'he spreads' (no.7).

In a diphthong the first element is longer.

5.4.3 In the phonetic transcription length marks will not be shown for typographical convenience.[2]

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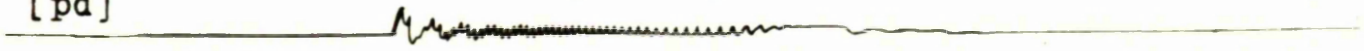
1. Dr. S.K.Chatterji observes that 'Final syllables in polysyllabic words, especially when the vowel is followed by m, n, ŋ, l or r are slightly long when at the end of a sense-group and before a pause'. (See 'A Bengali phonetic Reader', p.22.§ 55). It has been observed in this thesis that the final syllable of a polysyllabic word closed by any consonant is long in my pronunciation. Kymographic evidence supports this.
2. For a different convention see M.A.Hai, op.cit.

5. M [pa]



6. M [pat]

7. M [pate]

CHAPTER 6

Phonetic Description of the Bengali Consonantal Articulations

6.0 General Outline.

6.0.1 Places of articulation.

6.0.2 Manner of articulation.

6.0.3 Distinction of different Consonants.

6.1 Simple Consonantal articulations.

6.1.0 General Outline.

6.1.1 Plosive articulations.

6.1.2 Lateral articulations.

6.1.3 Tap articulations.

6.1.4 Sibilant articulations.

6.1.5 Nasal articulations.

6.1.6 Flap articulations.

6.2 Complex Consonantal articulations.

6.2.0 General Outline.

6.2.1 Inter-word Consonantal articulations

6.2.2 Intra-word Consonantal combinations.

6.2.2.0 General Outline

6.2.2.1 Consonant clusters within the structure of the stem.

6.2.2.1.1. Homorganic.

6.2.2.1.2 Heterorganic.

6.2.2.2 Reduplicated stem sequences.

6.2.2.3.1 Homorganic. 6.2.2.3 Stem-ending sequences

6.2.2.3.2 Heterorganic.

6.2.2.4 Geminated clusters in the stem-ending junction.

CHAPTER 6

Consonants in Bengali verbal form.

6.0 The articulatory labels attached to certain consonant sounds are related to the findings of a number of palatograms of sentences having these sounds. In the phonetic descriptions of places of articulation, the terminology is related where possible to the palatograms by means of the grid in the pocket on the back cover as follows;

6.0.1 Places of Articulation.

1. Bilabial : Palatograms do not show any wipe off for bilabial articulations.

2. Dental: refers to an articulation showing a wipe off in zone 1. The wipe off may extend as far back as to cover the whole area of zone 3, and part of zone 4.

3. Alveolar (non-retroflex): refers to an articulation in which the wipe off shows a contact in zones 3 and 4. (The wipe off may occasionally extend as far forward as zone 2).

4. Post alveolar (retroflex): refers to an articulation in which the wipe off shows a contact in zone 4. The wipe off may extend as far back as to cover part of zone 5, and as far forward as to cover the whole area of zone 3.

5. Alveolo-palatal: refers to an articulation in which the wipe off shows a contact from zone 7 to 3.

6. Velar: refers to an articulation which shows contact in zone 7 or further back. The wipe off may extend as far forward as zone 4 on the two sides.

7. Glottal: Palatograms do not show any wipe off for glottal articulations.

The term apical is used to describe an articulation in which the contact is made by the tip or the tip and blade of the tongue.

The term dorsal is employed to describe a tip-down articulation in which the contact is made by the front of the tongue or the back of the tongue or both.

The term labial is applied to an articulation in which the contact is made by the two lips.

In Bengali the tip or tip and blade of the tongue make contact for dental and alveolar wipe offs. They are therefore apical.

In Bengali the tip of the tongue is down for all velar and alveolo-palatal contacts. They are therefore dorsal.

For a dental, an alveolar plosive, alveolar nasal, lateral, or a dorso-alveolar-palatal articulation the wipe off on the palate shows a complete contact.

For a tapped, flapped or a sibilant articulation the contact is incomplete.

6.0.2 Manner of articulations

Consonants are described under the following headings: plosive, flap, lateral, tap, sibilant and nasal.

Each is distinguished from the others. plosive, lateral, tap, flap and sibilant are labelled as non-nasal consonants.

During the articulation of a non-nasal consonant the

soft palate is raised and the passage through the nose is completely blocked and the air passes through the mouth. A non-nasal consonant has the resonance cavity and the escape cavity in the mouth.

For the articulation of a nasal consonant the soft palate remains in its lowered position and the passage through the mouth is completely blocked or obstructed at a certain point due to the close contact of the articulating organs and the out-going air passes through the nose. A nasal consonant has resonance cavities in the mouth and nose and the escape cavity in the nose.

During the articulation of a plosive consonant the air passage is completely blocked at a certain point by the articulating organs and on release the air escapes with plosion.

For the articulation of a lateral consonant, the air passage is partly obstructed by the contact of the tip and blade of the tongue and the air passes out on one or both sides of the tongue.

A tap consonant is formed by a single tap of the tip of the tongue.

For the articulation of a flapped consonant, the contact is not maintained for any appreciable time.

During the articulation of a sibilant consonant the tip of the tongue is narrowed towards the alveolar region in such a way that the out-going air passes with an audible friction.

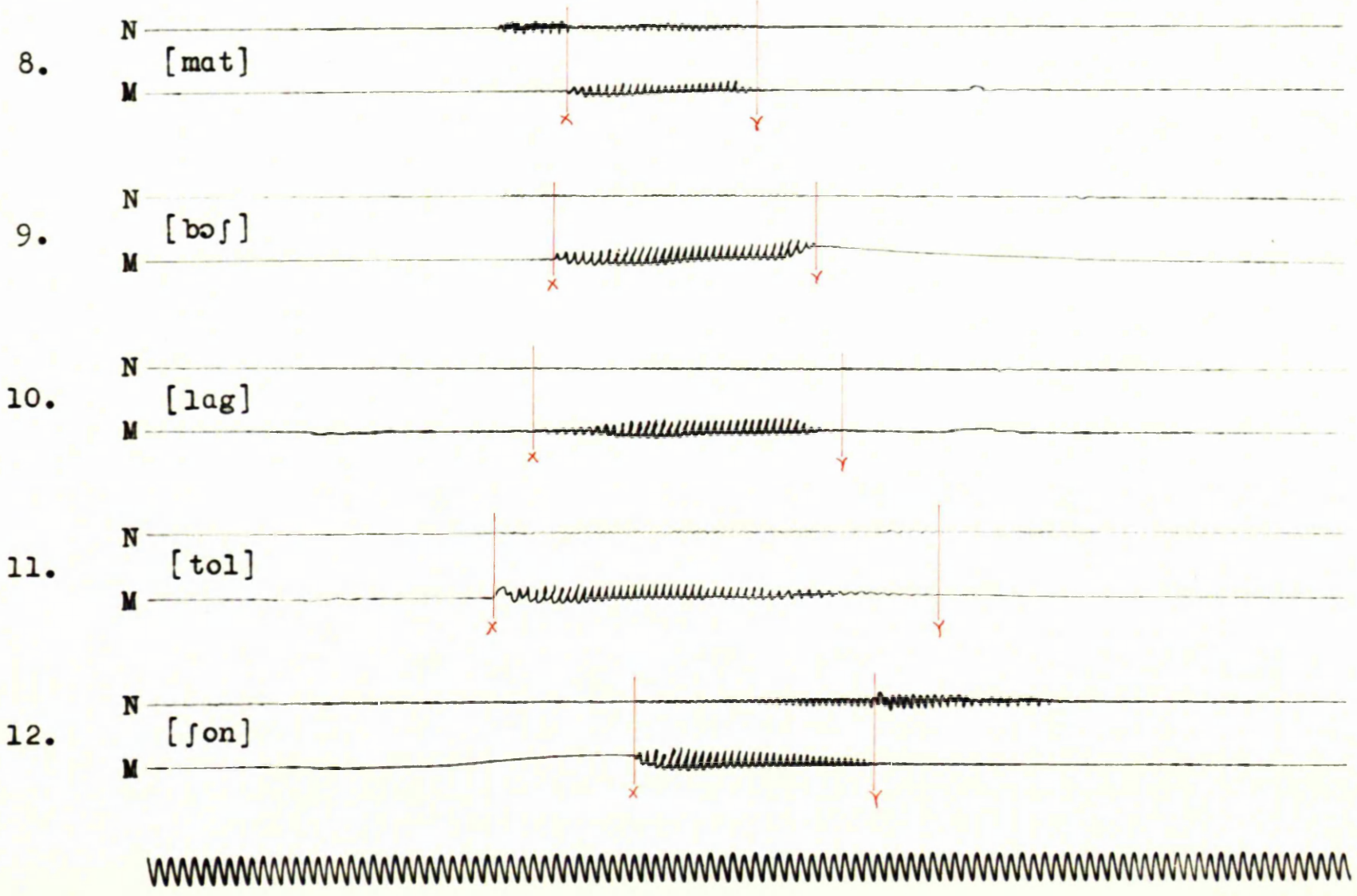
6.0.3 Different classes of consonants

The different classes of consonants are clearly distinguished kinaesthetically. Kymograph tracings also show different pictures for different classes of consonants. For example, a form containing a nasal consonant produces a different picture in the km. tracing from a form containing a non-nasal consonant. In order to show this difference, a few kymograms with simultaneous nasal and mouth tracings of some one-word verbal sentences, beginning with different consonants, are cited.

(8) [mat], (9) [bɔʃ], (10) [lag], (11) [tol], (12) [ʃon]

Each of these kms. shows that there is a wave form on the N tracing, wherever there is a wave form on the M tracing, but the amplitude of the wave form varies considerably. These variations are of three types. The forms which begin with a nasal consonant shows the greatest amplitude of the wave form. The forms which begin with a voiced consonant show lesser amplitude of wave form, and the forms which begin with a voiceless consonant shows the least amplitude of the wave form.

Kms. of [mat] (No.8), [bɔʃ] (No.9) and [lag] (No.10) show wave forms on the N tracing before X, a point chosen on M tracing for reference, which corresponds to the beginning of the vocalic articulation in the syllable. These forms involve


8.
N
[mat]
M
X
Y
9.
N
[bɔʃ]
M
X
Y
10.
N
[lag]
M
X
Y
11.
N
[tol]
M
X
Y
12.
N
[ʃon]
M
X
Y

a nasal consonant, a voiced plosive and a lateral consonant articulation respectively. The greatest amplitude of wave forms in N tracing both before and after X is seen in the km. of [mat]. (No.8) The kms. of [tol] (No.11) and [ʃon] (No.12) which involve a voiceless plosive and a sibilant consonantal articulation respectively, in the initial position do not show any wave form on the N line on the left of X.

This difference in the degree of amplitude of the wave form in the N tracing is characteristic feature associated with a form beginning with a nasal consonant, a form with a non-nasal voiced consonant, and a form with a non-nasal voiceless consonant respectively.[1]

Similar differences in the degree of amplitude of the wave form in the N tracing are also observed in the kms. of the forms ending with different consonants. See the above kms. of (8) [mat], (9)[bɔʃ], (10) [lag], (11) [tol], (12) [ʃon]

The five forms respectively involve a voiceless plosive, a voiceless sibilant, a voiced plosive, a voiceless lateral, and a voiceless nasal consonant finally.

The point y corresponds ~~with~~ to the end of the vocalic articulation. In the N tracing of the words [mat] (No.8) and [bɔʃ] (No.9) there is no prominent waveform on the right of y. Kms. of the forms [lag] (No.10),[tol] (No.11) and [ʃon] (No.12)

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1. M.A.Hai, in his thesis 'Nasals and Nasalization in Bengali' has ably brought out these differences with the help of kymographic evidence. See, M.A.Hai 'Nasals and Nasalization in Bengali,' University of Dacca, 1960. p.109.ff.

which respectively involve a final voiced plosive, a voiced lateral and a voiced nasal consonant articulation, show wave forms in the N tracing on the right of y. The degree of amplitude in the wave forms in N tracing is greater in the form which involve a nasal consonantal articulation (i.e. the form [ʃon]) than a form involving a voiced consonantal articulation (i.e. the form [lag] or [tol].).This highest degree of amplitude in the wave form in N tracing is a characteristic feature associated with nasal consonantal articulation in the final position. This helps us to distinguish a nasal consonant articulation from a non-nasal consonant[1] in the final position.

Just as the difference between a nasal and a non-nasal consonantal articulation is observable in the kymograph tracings, so also the difference between a plosive and a non-plosive consonantal articulation can be seen in the kymograph tracings. Compare, for example, kms. of [tol] (No.11),[lag] (No.10) and [ʃon] (No.12) for an initial plosive, lateral and sibilant consonantal articulation respectively, and kms. of [tol] (No.11), [lag] (No.10), and [boʃ] (No.9) for final a lateral, plosive and sibilant articulation.

In the M tracing of [ʃon] (Km No12) there is an

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1. It may also be noted that the smaller degree of amplitude that is seen in the N line in the case of a voiced plosive, lateral, tap and other voiced articulations, is significant in itself but not so important from the point of view of nasality and is associated with characteristic non-nasal voiced articulation. See J. Carnochan, 'A study in the phonology of an Igbo Speaker,' B.S.O.A.S, Vol.XII, part2, 1948, pp.417-26.
See also R.H.Robins, 'Vowel nasality in Sundanese'- 'studies in linguistic analysis', special volume of the Philological Society, 1957, pp.97

upward displacement of the wave form to the left of X, which is a feature of the slow release of the fricative sound [ʃ-] in [ʃon].

In the M tracings of [tol] (Km.No.11) and [bɔʃ] (Km.No.9) the sudden release of the plosive sounds [t-] and [b-] respectively in [tol] and [bɔʃ] is shown by slight disturbance.

The feature of lateral release of [l-] in the form [lag] (Km.No.10) is also seen at the point X, from where the amplitude in the wave form gradually increases, in the M tracing.

Features of the final articulations of [bɔʃ], [tol], [lag] and [mat] are also seen in the kymographs. In the M tracing of the km. of [bɔʃ] (No.9) the upward displacement in the wave form begins with the release. In the km. of [tol] (No.11) there is a gradual diminution in the amplitude of the wave form with lateral release. In the kms. of [mat] (No.8) and [lag] (No.10) the diminished wave form continues for only a few cycles.

The consonant articulations are either:

I. Simple consonantal articulation, or

II. Complex consonantal articulation.

6.1 Simple Consonantal articulations

6.1.0. Simple consonantal sounds are short in duration, and involve less energetic movements of the articulating organs than complex consonantal articulations. They can occur

initially, intervocalically, and finally.

6.1.1 Simple Plosive Consonants

According to their place of articulation the plosive consonants in Bengali are discussed under five heads: velar, alveolo-palatal, post-alveolar (retroflex), dental and bilabial.[1]

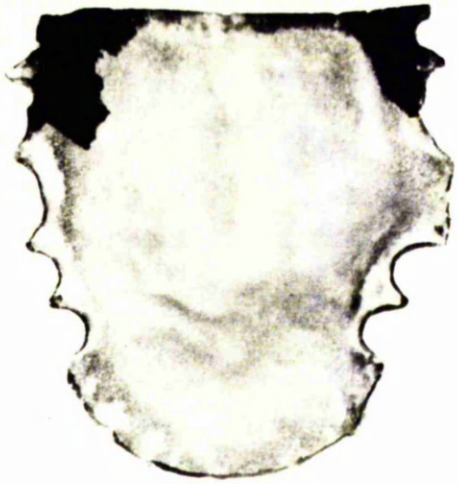
In order to show their differences the following palatograms of one-word verbal sentences beginning with different plosive consonants in initial position are cited:

Pm. No.1 [kɔm]
" No.2 [cap]
" No.3 [ʈip]
" No.4 [tap]
" No.5 [pa]

The Pm. (No.1) of the form [kɔm] shows a contact in the two corners of the back of the artificial palate. There is a tendency of linking the two bits of wipe off in the two corners on the centre of the back of the artificial palate. This shows that the back of the tongue is raised behind the hard palate but does not always reach the artificial palate

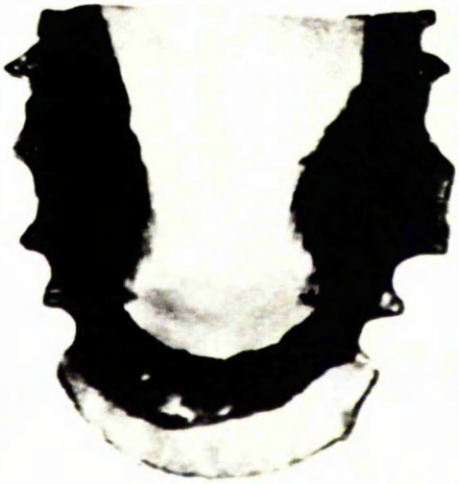
1. In traditional grammar books plosive consonants are arranged discussed under five 'vargas' or series: kənthyə vərgə or velar series, talə̆byə vərgə or palatal series, murdhənyə vərgə or cerebral series, dəntyə vərgə or dental series, oʂthyə vərgə or bilabial series. I have used all these terms except 'palatal' for which I use the term 'alveolo-palatal'.

1. [ɒm]

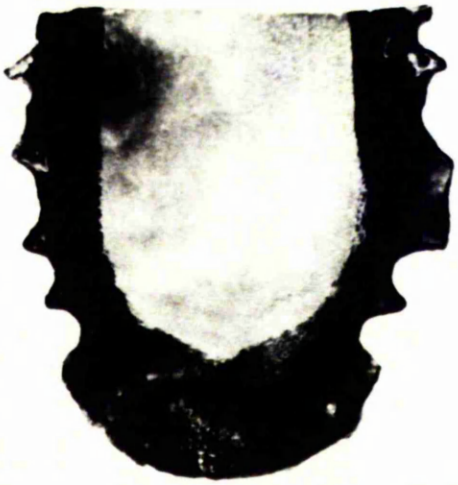


2. [cip]

3. [ʈip]



4. [tap]



5. [pɑ]

to leave any impression. [k-] in [kɔm] is a velar articulation. pm. (No.1) of [kɔm] may be compared with the pms. (Nos.3 and 4) of [ʈip] and [tap] which do not show such tendency of linking the wipe offs on the two corners.

The pm. (No.2) of the form [cip] shows a wipe off covering a wide area from zone 3 up to zone 7, leaving an unwiped area along the centre of the palate, which extends up to zone 5. In the articulation of [c-] in [cip] the tip of the tongue is down. [c-] in [cip] is an alveolopalatal articulation.

The pm. (No.3) of the form [ʈip] shows a bow shaped wipe off covering a part of zone 4 and a part of zone 3. For the articulation of [ʈ-] in [ʈip] the tip of the tongue makes contact. [ʈ-] in [ʈip] is a post alveolar (retroflex) articulation.

The pm. (No.4) of the form [tap] shows a wipe off covering the whole area from zone 1 to 3 and a portion on the left and right of zone 4. For the articulation of [t-] in [tap] the tip and blade of the tongue make contact. [t-] in [tap] is a dental articulation.

The pm. (No.5) of [pa] does not show any wipe off. For the articulation of [p-] in [pa] the two lips make contact. [p-] in [pa] is a bilabial articulation.

Similar differences in the wipe offs are also observed in the pms. of the forms ending with different classes of plosive consonants.

See pms. of the forms:

pm. No.6. [pak]

pm. No.7 [kac]

pm. No.8 [piṭ]

pm. No.9 [pat]

pm. No.10 [map]

The pm. (No.6) of [pak] shows slight contact of the back of the tongue at the two ends of the base line of the artificial palate. The wipe off does not reach the third molar line. There is also a linking tendency of the two bits of wipe off of the two corners in the centre of the back of the palate.

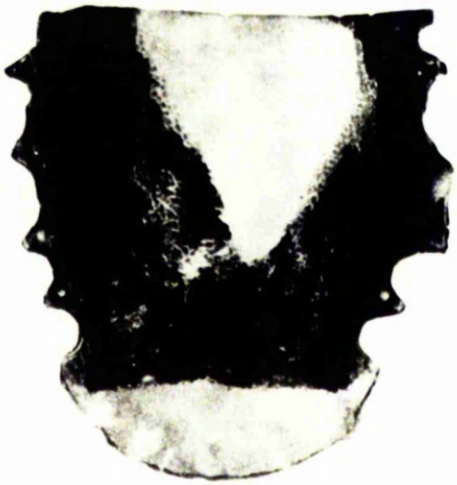
The pm. (No.7) of [kac] shows a wipe off covering a wide area from zone 3 up to zone 7, leaving an unwiped area in the centre of the tongue. It shows the same feature as that of the form [cip] (pm. No.2).

The pm. (No.8) of [piṭ] shows a bow-shaped wipe off covering a part of zone 4 and part of zone 3. The wipe off shows almost similar feature to that of [ṭip] (pm. No.3).

The pm. (No.9) of [pat] shows a wipe off covering zones 1 to 3 and a part of zone 4 on the right and left of central zonal line. The wipe off shows similar feature to that of [tap] (pm.No.4).

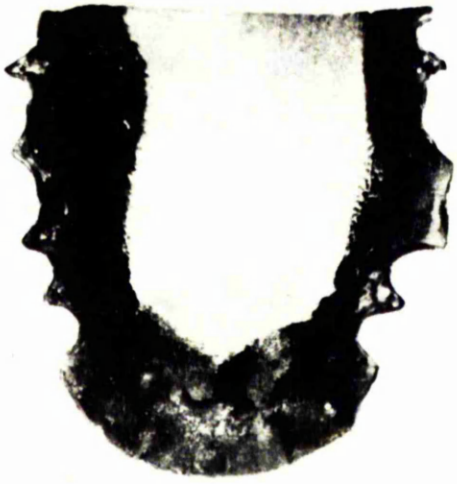
6. [pak]

7. [kac]



8. [pit]

9. [pat]



10. [map]

The pm. (No.10) of [map] shows slight contact of the back of the tongue at the two ends of the base line of the artificial palate. This corresponds to the raising of the tongue for the vocalic articulation [a] before [-p].

[-k] in [pak], [-c] in [kac], [-ʈ] in [piʈ], [-t] in [pat] and [-p] in [map] are respectively a velar, alveolo-palatal, post-alveolar (retroflex), dental and bilabial plosive consonants.

The plosive consonants are further distinguished by two features of voice and aspiration.

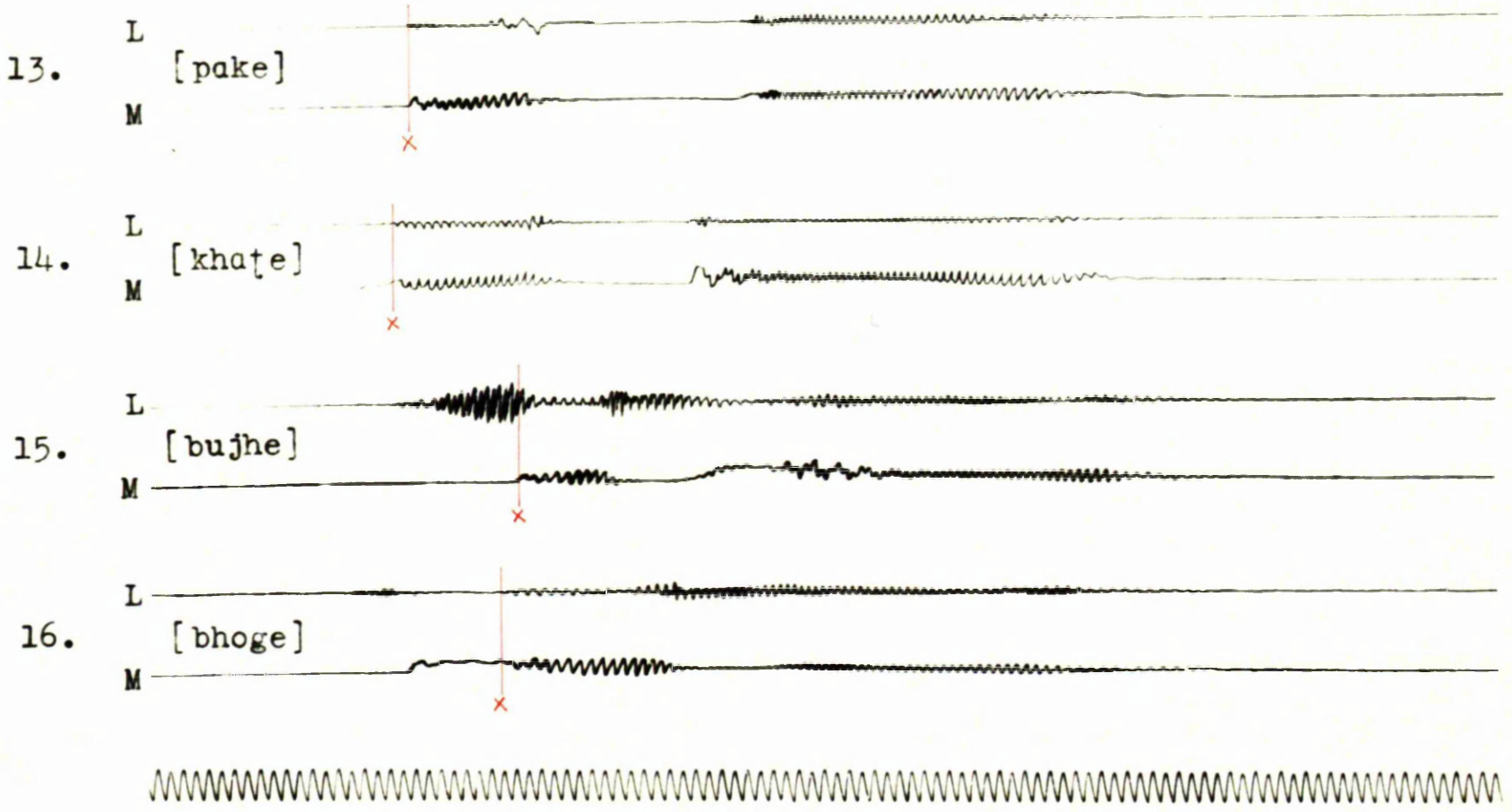
Following kms. with simultaneous mouth and larynx tracings of some one-word verbal sentences with different consonants in initial position are cited.

(13) [pake] (14) [khaʈe]

(15) [bujhe] (16) [bhoge]

Each of these kms. shows that there is a wave form on the L tracing wherever there is a wave form on the M tracing but the amplitude of the wave forms varies considerably. The period of presence of prominent wave forms in the M tracing to the right of X corresponds with the vocalic articulation of the first syllable of the forms.

There are prominent wave forms in the L tracing to the left of X, of the tracings of the forms [bujhe] (No.15) and [bhoge] (No.16), parallel to the oral closure in the M tracing. There is no such prominent wave forms to the left of


13.
L
[pake]
M
14.
L
[khaṭe]
M
15.
L
[bujhe]
M
16.
L
[bhoge]
M

X in the L tracing of the forms [pake] (No. 13) and [khaṭe] (No.14). The wave forms in the L tracing of [bujhe] (No.15) and [bhoge] (No.16) to the left of X parallel with the closure in the M tracing correspond to the vibration of the vocal cords during the consonantal articulation of syllable one of these forms. The absence of wave forms in the L tracing of kms. of [pake] (No.13) and [khaṭe] (No.14) to the left of X parallel with oral closure in the M tracing corresponds to the absence of vibration of the vocal cords during the period of articulation of the consonant in the first syllable of these forms.

There is a vertical displacement of the wave forms in M tracing to the left of X in the tracings of [pake] (No.13) and [khaṭe] (No.14) parallel to which there is no wave form in the L tracing. This displacement continues for a considerable period in the tracing of [khaṭe] (No.14), which corresponds to the increased breath force in the voiceless articulation . The displacement of wave form in the M tracing before X, of the form [pake] (No.13) does not continue for a considerable period but shows slight disturbance, which corresponds to the absence of increased breathforce in the voiceless articulation.

In the tracings of [bhoge] (No.16) and [bujhe] (No.15) where the prominent wave forms continue in the L tracing from before X, there is an upward displacement in the wave form in M tracing at the left of X, of the form [bhoge] (No.16) which corresponds to the increased breathforce in the voiced articulation. In the tracings of [bujhe] (No.15) there is no

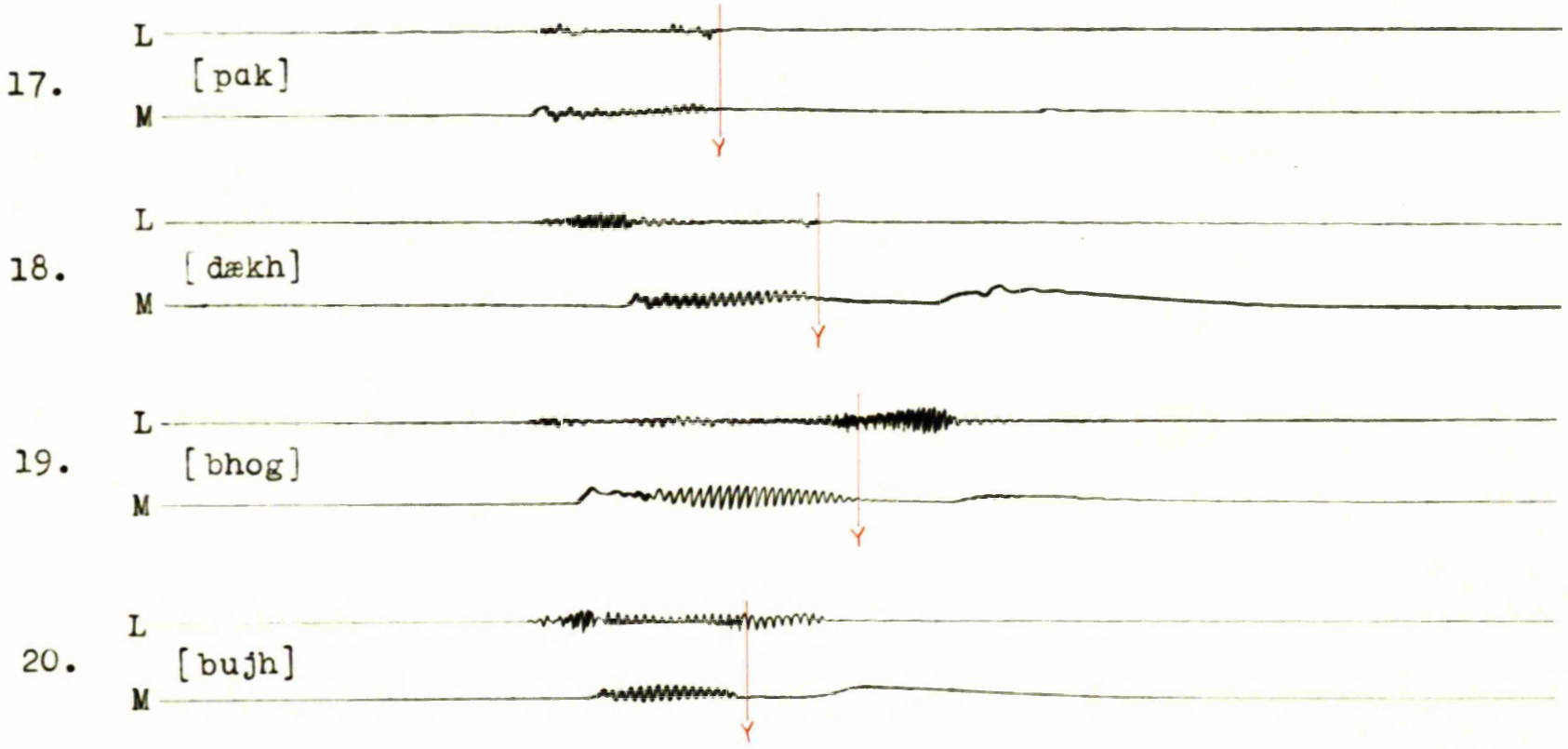
such displacement in the M tracing, which corresponds to the absence of increased breathforce in the voiced articulation.

These different types of consonantal release of the forms [pake], [khaṭe], [bujhe] and [bhoge] will be termed voiceless unaspirated, voiceless aspirated, voiced unaspirated and voiced aspirated respectively.

Similar differences in the wave forms are also observed in the kms. of the words ending with different consonants. See, for instance, the kms. of [pak] (No. 17) [dæ̀kh] (No. 18), [bhog] (No. 19) and [bujh] (No. 20) which involve respectively, a voiceless unaspirated, a voiceless aspirated, a voiced unaspirated, and a voiced aspirated consonant. The point in the tracings corresponds with the ending of the vocalic articulation.

In the kms. of [pak] (No.17] and [dæ̀kh] (No.18) containing a final voiceless plosive articulation, the L tracing does not show any wave form beyond the point y, while in the kms. of [bhog] (No.19) and [bujh] (No.20) containing voiced plosive articulation the wave forms continue across point y in the L tracing.

There is an upward displacement of the wave forms to the right of Y in M tracings of the forms [dæ̀kh] (No.18) and [bujh] (No.20) containing aspirated plosive articultaion. The voiced plosive in the final position, just as in the initial position, can be differentiated from the voiceless ones by the fact that they produce prominent wave forms in L tracing; and aspirated plosives from the unaspirated ones by the fact that


17.
L
[pɑk]
M
18.
L
[dækh]
M
19.
L
[bhog]
M
20.
L
[bujh]
M

they show an upward displacement in the wave forms in M tracing.

In Bengali verbal forms plosive consonants of all five series - velar, alveolo-palatal, retroflex, dental and bilabial occur in all three positions, initial, medial and final, as can be seen from the following examples.

(a) Initially

	voiceless unaspirated	voiceless aspirated	voiced unaspirated	voiced aspirated
Velar	[k-] [kaʈ]	[kh-] [khaʈ]	[g-] [gal]	[gh-] [ghur]
Alveolo-palatal	[c-] [cap]	[ch-] [chap]	[j-] [jɔp]	[jh-] [jhul]
Retroflex	[ʈ-] [ʈik]	[ʈh-] [ʈhek]	[ɖ-] [ɖak]	[ɖh-] [ɖhak]
Dental	[t-] [tol]	[th-] [thak]	[d-] [dækh]	[dh-] [dhɔr]
Bilabial	[p-] [pat]	[ph-] [phãʈ]	[b-] [bɔl]	[bh-] [bhab]

(b) Intervocalically.

Velar	[-k-] [pake]	[-kh-] [dækhe]	[-g-] [jage]	-
Alveolo-palatal	[-c-] [kace]	[-ch-] [moche]	[-j-] [baje]	[-jh-] [bəjhe]
Retroflex	[-ʈ-] [piʈe]	[ʈh-] [uʈhe]	-	-
Dental	[-t-] [pate]	[-th-] [məthe]	[-d-] [kãde]	[-dh-] [ʃadhe]
Bilabial	[-p-] [mape]	[-ph-] [lophe]	[-b-] [ɖəbe]	[-bh-] [nibhe]

(c) Finally

velar	[-k] [pak]	[-kh] [dækh]	[-g] [jag]	-
Alveolo-palatal	[-c] [kac]	[-ch] [moch]	[-j] [baj]	[-jh] [bəjh]
Retroflex	[-ʈ] [piʈ]	[-ʈh] [oʈh]	-	-
Dental	[-t] [pat]	[-th] [məth]	[-d] [kãd]	[-dh] [ʃadh]
Bilabial	[-p] [map]		[-b] [ɖəb]	

(a) Initial plosives

The following plosive consonants occur initially: [k-], [kh-], [g-], [gh-], [c-], [ch-] [j-], [jh-], [ʈ-], [ʈh-], [ɖ-], [ɖh-], [t-], [th-], [d-], [dh-], [p-], [ph-], [b-], and [bh-].

Initial velar plosives are represented by the phoentic transcriptions: [k-], [kh-], [g-], [gh-].

For the articulation of [k-] in the example [kɔm] the back of the tongue is raised against the velum and on release the air passes with an audible plosion, the vocal cords do not vibrate. The tip of the tongue is down during the articulation.

The pm. (No.1) of the form [kɔm] shows a wipe off in the two corners of the back of the artificial palate, which does not extend up to the 3rd molar line. There is a tendency of linking the two wipe offs on the back of the artificial palate. The type of wipe off which is associated with a dorsal velar contact on the artificial palate is typical of initial [k-], medial [-k-] and final [-k]. See pm - of [kɔm] (No.1) and [pak] (No.6). In some pms. of the forms with initial [k-] the wipe off extends further forward on the two sides of the artificial palate so as to reach 1st molar line.

Km. of the form [kac] (No. 33, Appendix) shows that there is no wave form in the L tracing before the point X, and that there is a little disturbance to the left of X in the M tracing. These correspond to the voiceless unaspirated articulation of

the syllable initial in the form.

For the articulation of [kh-] in the example [khabe] exhalation of breathforce is greater than for [k-] in [kome] and aspiration is heard during the release. The vocal cords do not vibrate during the initial closure and breathy release.

The pm. (No.45)(Appendix) of the form [khabe] gives similar wipe off in the corners of the back of the artificial palate, which extends up to the ~~3rd~~ 1st molar line.

For the articulation of [g-] and [gh-] in the examples [gabe] and [ghame] the vocal cords vibrate, and the exhalation of breathforce is greater during the articulation of [gh-] in [ghame] than for [g-] in [gabe], and aspiration is heard during the release of the [gh-] in [ghame].

The pms. of the forms [gabe] and [ghame] show similar wipe offs to that of [khabe]. The tendency of linking is seen in all three pms.[1]

Kms. of the forms[kace](No.34)[khaṭe](No.14),[gabe] (NO.35) and [ghame] (No.36)(Appendix) can be compared.

In general phonetic terms [k-], [kh-], [g-] and [gh-] may be described as voiceless unaspirated, voiceless aspirated voiced unaspirated and voiced aspirated velar plosives respectively.

Initial alveolo-palatal plosives are represented by the phonetic transcriptions : [c-], [ch-], [j-], and [jh-]. They

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1. Palatograms of [kom] and [khabe] can be taken as representative for initial velar articulation. Pms. with [g-] and [gh-] are not cited.

represent respectively an initial voiceless unaspirated, voiceless aspirated, voiced unaspirated and voiced aspirated alveolo-palatal affricated plosive consonant.

For the articulation of [c-] in [cape] the main body of the tongue is firmly fixed against the roof of the mouth, the air is compressed by pressure from the lungs and when the air is released it escapes from the mouth with an affricated plosion. The central part of the back of the front of the tongue does not reach the roof of the mouth. The tip of the tongue is down during the articulation.

The pms. of the forms [cip] (No.2) shows a wipe off covering a wide area from zone 3 up to zone 7, leaving an unwiped area along the centre of the palate, which extends from zone 7 to Pure gum 5. In traditional grammar books and in Bengali orthography the sound is regarded as 'talebyə' or palatal. Some phoneticians have regarded these sounds as affricates,[1] while others as plosives.[2] I classify these sounds as alveolo-palatal plosives.[3]

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1. See S.K.Chatterji, A Bengali Phonetic Reader, § 20.
   B.R.Saksena, Evolution of Awadhi, § 30.
   Muhiuddin Qadri, Hindustani Phonetics, p.82.
2. See J.R.Firth, Introduction to Harley's Colloquial Hindustani, p. XVI.
   and also T.Grahame Bailey, Punjabi Phonetic Reader, p.XI. There he expressly remarks that these sounds [-c-], [-j-] are essentially different from the groups [-tʃ-], [-dz-] etc. See also Lambert, Marathi Language Course, p.10. S.M. Katre, The formation of Konkani § 84. and Konkani phonetics, § 15. Hornley, Grammar of the Goudian Language. p.7.
3. M.A.Hai, in his thesis did not accept the traditional terminology 'palatal' for this series. According to his classification these are 'dorso alveolar' sounds. See 'Nasals and Nasalization in Bengali', p.185. His pms. show wipe offs further forward than those of mine.

The pm. of the form [jɔpe] (No.47) shows wipe off extending up to canine line; the pm. of the form [chape] (No.46)(Appendix) shows a wipe off slightly more forward than for [cape] or [jɔpe]; in the pm. of [jhume] (No.48) the wipe off does not reach up to canine line. The tongue is retracted because of the presence of the following back vowel [-u]. With a following back vowel [c-] is more retracted and with a front vowel after it, it is more advanced. The initial [c-] in [cipe] which is followed by a front vowel [i] is slightly more advanced than the initial [c-] in [cume] which is followed by back vowel [-u-]. See pms. of [cipe] (No.11) and [cume](No.12).

Kms. of the forms with initial [c-], [ch-], [j-] and [jh-] show similar features of voicing and voicelessness, aspiration and absence of aspiration. See kms. of [cillae](No.37), [chilae] (No. 38)(Appendix) and [jɔpe] (No.24)(P. 241 A).

Initial retroflex plosive consonants are represented by the phonetic transcriptions: [ʈ-], [ʈh-], [ɖ-] and [ɖh-].

[ʈ-] represents a voiceless unaspirated retroflex plosive;

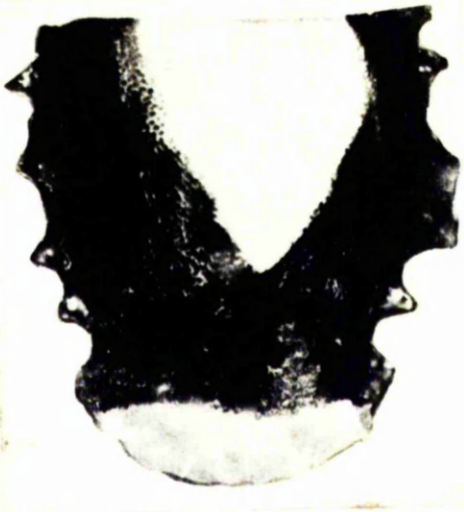
[ʈh-] represents a voiceless aspirated retroflex plosive;

[ɖ-] represents a voiced unaspirated retroflex plosive;

[ɖh] represents a voiced aspirated retroflex plosive.

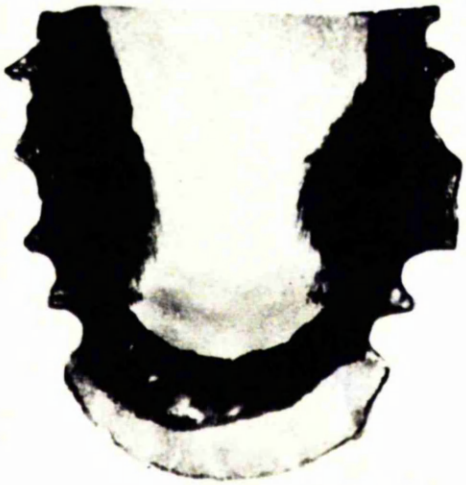
For the articulation of the retroflex plosive [ʈ-] in the word [ʈip] the air passage is completely blocked by curling back the tip of the tongue and bringing it into contact at some point above the upper gum between the denti-alveolar and the pre-palatal zones. There is a hollow cavity in the mouth, and the air is released with an audible retroflexion.

11. [cipe]

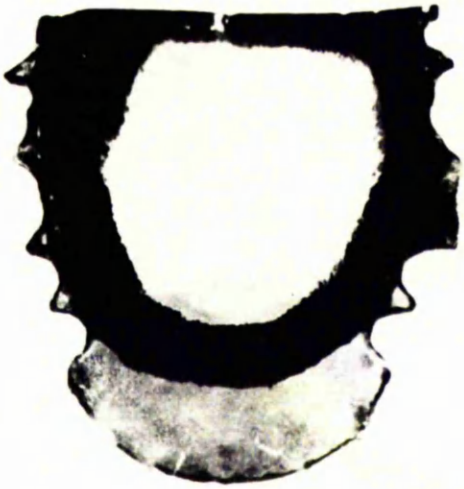


12. [cume]

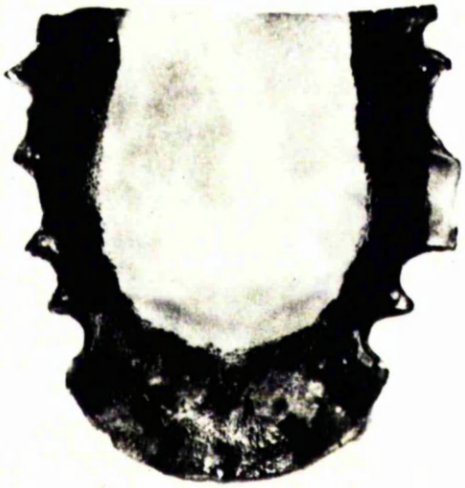
3. [ṭip]



13. [ṭok]



14. [dibi]



15. [dobo]

The actual point of articulation depends on the position of [ʈ] in the word and the nature of the adjoining vowels.

The pm. of [ʈip](No.3) shows a wipe off covering a part of zone 4 and extending as far forward as to cover a part of zone 3. The pm. of [ʈok](No.13) shows a wipe off which covers part of zone 4 and extends slightly forward ~~than~~ of the canine line. The hollow cavity in the mouth cannot be recognized by seeing the palatograms only. It is distinctly noticeable at the level of perception.[1] The pm. of [ɖak](No.50)$_{A}$ (Appendix) shows a bow shaped wipe off which covers the whole of zone 4 and does not extend forward beyond the canine line.

The pm. of [ʈhek](No.49)$_{A}$ (Appendix) shows a bow shaped wipe off which covers only zone 4.

The kms. of the forms with initial [ʈ-], [ʈh-], [ɖ-] and [ɖh-] show similar features of voicing and aspiration and absence of them as for the other voiced, voiceless and aspirated, and unaspirated plosive consonant articulation. See Kms.of [ʈip] (NO. 40), [ʈhek](No.41)$_{A}$ (Appendix) and [ɖakae](No.22) (P. 184A).

In terms of place of articulation [ʈ-], [ʈh-], [ɖ-] and [ɖh-] of the forms cited above, may be termed as post alveolar

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1. It is observed in the present research that the dark quality in retroflex articulation is not so marked in Bengali as in other modern Indian languages. It is also observed that the retroflex apical contact in most utterances in Bengali is not so far back as the retroflex apical contact in other modern Indian languages. M.S. De Silva observed similar feature in Sinhalese. See Verbal piece in Colloquial Sinhalese: A Phonological Study. Thesis submitted for the degree M.A. in the University of London. 1957.

plosive, but since the posture of the tongue is different from the posture of the tongue for an alveolar consonantal articulation, I use the term 'retroflex' which is widely used in both traditional and modern descriptive linguistics.[1]

Initial dental plosives consonants are represented by the phonetic transcriptions: [t-], [th-], [d-], [dh-].

[t-] represents a voiceless unaspirated dental plosive:

[th-] represents a voiceless aspirated dental plosive:

[d-] represents a voiced unaspirated dental plosive:

[dh-] represents a voiced aspirated dental plosive.

For the articulation of the dental plosive consonant [t-] in [tape] the tip and blade of the tongue is raised against the upper teeth and teeth-ridge.

The pms. of [tapø](No.4), (P.148A) [thame](No.51), (Appendix) and [dɔme](No.52) (Appendix) show wipe offs covering an area from zone 1 to 3 and extended as far back as a part of zone 4.

The Kms. of the forms [tape](No.42), [thame](No.43), (Appendix) [dækhe](No.27), (P.243A) [dhɔre](No.44) (Appendix) show features of voicelessness and absence of aspiration for the initial articulation of the form [tape], voicelessness and aspiration for the initial articulation of the form [thame], voicing and absence of aspiration for the initial articulation of the form [dɔme],

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1. See Varma, S., Critical Studies in the phonetic observations of Indian Grammarians, 1929. See also Allen, W.S., Phonetics in Ancient India, Oxford University Press, London, 1953; Retroflexion in Hindi., B.S.O.A.S. XVI, 3, (1954) pp. 556-565.

and voicing and aspiration for the initial articulation of the form [dhobe].

Initial bilabial plosive consonants are represented by the phonetic transcription: [p-], [ph-], [b-], [bh-].

[p-] represents a voiceless unaspirated bilabial plosive;

[ph-] represents a voiceless aspirated bilabial plosive;

[b-] represents a voiced unaspirated bilabial plosive;

[bh-] represents a voiced aspirated bilabial plosive.

For the articulation of the bilabial plosive consonant [p-] in the form [pabe] the two lips are brought together and when the air is released it passes with a plosion.

A bilabial articulation does not show any wipe off on the artificial palate. See pms. of [pa](No.5)(P 148A)

Kms. of the forms [pake](No.13) [bujhe] (No.15) (P. 151A) and [bhoge](No. 16) (P.151A) show similar features of voicing and voicelessness and aspiration and absence of aspiration, as for other initial consonants.

I have two alternative pronunciations of [phole] and [bhole] which may be represented in the phonetic transcription as [Φole] and [βole]. [Φ-] and [β-] respectively represent bilabial voiceless fricative and bilabial voiced fricative in the articulation of which the lips are narrowed together and on release an audible weak friction is produced.[1]

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1. With some speakers, specially in East Bengal, [p-] and [Φ-], and [b-] and [β-] are free variants.

(b) Intervocalic plosives

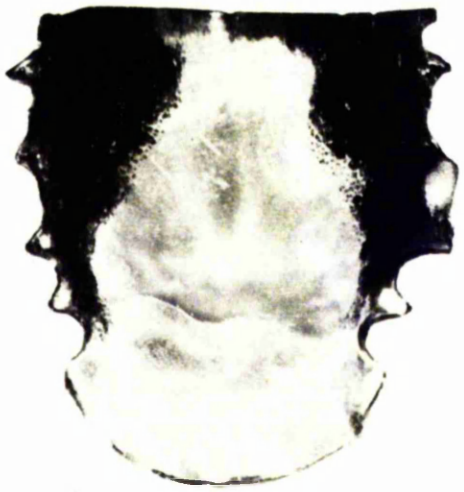
The following plosive consonants occur intervocalically: [-k-], [-kh-], [-g-], [-c-], [-ch-], [-j-], [-jh-], [-ʈ-], [-ʈh-], [-t-], [-th-], [-d-], [-dh-], [-p-], [-ph-], [-b-], [-bh-].

The movements made by the speech organs during the articulation of [-k-] in [ɖake], [-kh-] in [dɔ̃khe], [-g-] in [jage], [-c-] in [kace], [-ch-] in [muche], [-j-] in [baje], [-jh-] in [bujhe], [-ʈ-] in [kaʈe], [-ʈh-] in [uʈhe], [-t-] in [pate], [-th-] in [mɔthe], [-d-] in [kãde], [-dh-] in [ʃadhe], [-p-] in [jɔpe], [-ph-] in [luphe], [-b-] in [bhabe], [-bh-] in [nibhe], are similar to those which they make during the articulation of initial plosive consonants, e.g. [k-] in [kɔme], [c-] in [cipe], [ʈ-] in [ʈip], [t-] in [tape], and [p-] in [pabe], except that an intervocalic consonant has greater force in articulation than an initial or final consonant.

Compare, for instance, palatograms of [mothe](No.53) and [thame](No.51) (Appendix), which show the same area of wipe off for the dental contact, pms. of [kace](No.54) (Appendix), [cip](No.2), [ʈip](No.3) (P.148A), and [piʈo](No.21) (P.164A), may also be compared.

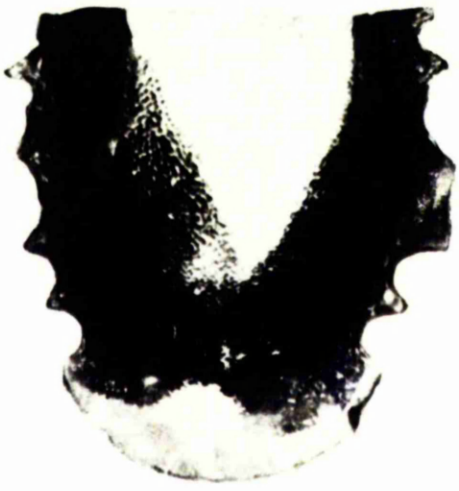
The intervocalic [-ch-] in [muchi] which is followed by the front vowel [-i] is more advanced than [-ch-] in [mocho] which is followed by the back vowel [o]. [muchi] and [cipe] show wipe offs in the same area. See pms. of [muchi](No.18) (P.159A), [mocho](No.19) and [cipe](no.11) (P.159A). Same features are observable in the articulation of [bujhi] and [bojho].

16. [boki]



17. [boko]

18. [muchi]



19. [mocho]

The intervocalic [-k-] in the forms [boki] and [paki] show a slightly more advanced wipe off than [-k-] in [boko]. See pms. Nos. 16 and 17 of the forms [boki] and [boko].

Pms. of [pati] and [pato] do not show any difference in area of wipe offs.

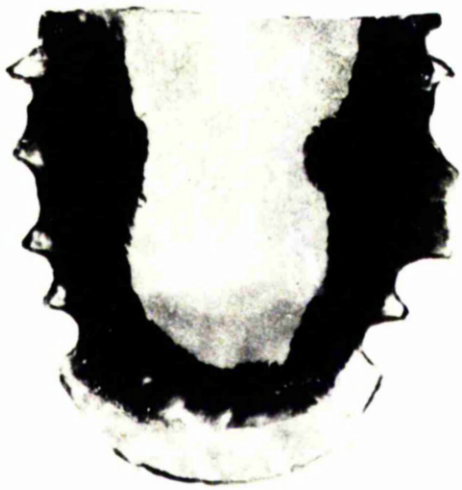
An intervocalic [-ṭ-] has greater force and more retroflexion in its articulation than an initial [ṭ-] or a final [-ṭ]. This can not be shown in palatogram.

With a following or preceding back vowel a [ṭ-] or [-ṭ] is more retracted and with a front vowel before or after it, it is more advanced.

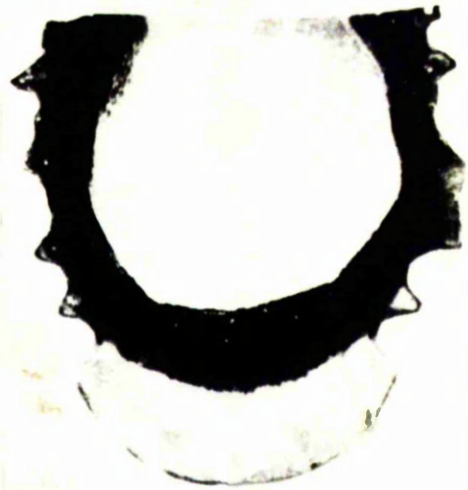
Pms. of the words [ṭip](No.3)(148A) and [piṭ](no.8)(150A) show a similar bow shaped wipe off covering part of zone 4 and part of zone 3. Pm. of the word [koṭo](No.23) shows that the wipe off covers the whole area of zone 4 and part of zone 5, and it does not extend more forward than canine line.

The intervocalic [-ṭ-] of [piṭi] which is both followed and preceded by the front vowel [i] is more advanced than the initial [ṭ-] of [ṭip] and is articulated as far forward as to have contact with a part of the denti alveolar zone, and incisor line. The maximum retroflexion in the series of these instances is shown in [koṭo] which is both preceded and followed by a back vowel. See pm. of [koṭo](No.23). The wipe off for [koṭo] covers a part of the pre-palatal and almost the whole of the post alveolar zone leaving only a small portion at the corner. Between a vowel which follows and a vowel which precedes [-ṭ-] the latter seems to have a greater

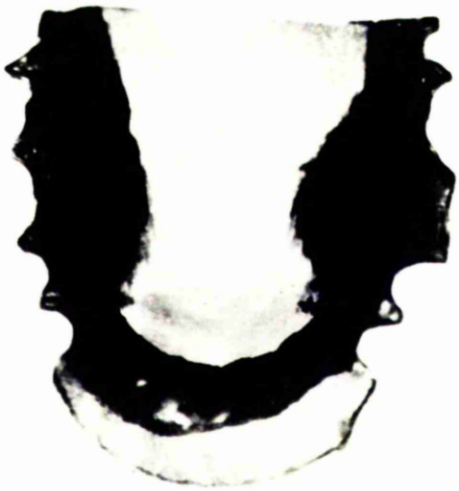
20. [pi̯ti]



21. [pi̯to]



22. [ku̯ti]



23. [ko̯to]

controlling effect upon the articulation contact than the former, e.g. when [i-] preceded and [-o] follows [-ṭ-] (as in [piṭo], it is more advanced with its area of wipe off covering the whole of the alveolar zone and touching the lateral incisor line; on the other hand when [a] is used before and [i] after it (e.g. in [kaṭi] it is more retracted with its area of wipe off covering half of the post alveolar and half of the alveolar zones.

Kms. show features of differences as regards the aspirated and unaspirated and also the voiced and voiceless consonants, similar to those of the initial consonants.

(c) Final plosives

Plosive consonants that occur finally in a verbal form are 16 in number. They are [-k], [-kh], [-g], [-c], [-ch], [-j], [-jh], [-ṭ], [-ṭh], [-t], [-th], [-d], [-dh], [-p], and [-b].

In the articulation of a final plosive the articulating organs undergo similar organic movements as in the articulation of an initial plosive. The difference is that unaspirated plosive consonants are not released in final position.

The pm. of [pak] (No.6) (P150A) shows a similar wipe off as for [kɔm] (no.1) (168A), the pm. of [mɔth] (No.56) (Appendix) shows similar wipe off

as for [thame](No.51)(Appendix). Similar wipe offs are observed in the case of an initial and a final alveolo-palatal and retroflex plosive consonant. See pms. of [ʈip](No.3)(148A), [piʈ](No.8)(150A) and [cap](No.2)(148A), [kac](No.7)(150A).

Kms. show similar feature of voicing and aspiration in the utterance with different plosive consonant in the final position, to those in the initial or medial position. See kms. of [pak](No.17)(153A), [kac](No.33), [piʈ](No.45) and [pat](No.46)(Appendix) [bhog](No.19) [dɛ̃kh] (No.18) [bujh](No.20)(153A) and [ʃadh](No.47)(Appendix) These Kms. show that for the final voiceless unaspirated plosive consonant the stop is of long duration, and for the voiced aspirated and unaspirated and voiceless aspirated consonantal articulation the stop is of short duration. Thus, to sum up, the following plosive consonants are found in verbal forms. The number of plosive consonants occur initially, intervocalically and finally is 20, 17, and 15 respectively.

	Initially	Intervocal - ically	Finally
Velar	[k-], [kh-] [g-], [gh-]	[-k-], [-kh-] [-g-] -	[-k], [-kh], [-g] -
Alveolopalatal	[c-], [ch-] [j-], [jh-]	[-c-], [-ch-] [-j-], [-jh-]	[-c], [-ch], [-j], [-jh],
Retroflex	[ʈ-], [ʈh-] [ɖ-], [ɖh-]	[-ʈ-], [-ʈh-]	[-ʈ], [-ʈh]
Dental	[t-], [th-] [d-], [dh-]	[-t-], [-th-] [-d-], [-dh-]	[-t], [-th] [-d], [-dh]
Bilabial	[p-], [ph-] [b-], [bh-]	[-p-], [-ph-] [-b-], [-bh-]	[-p] - [-b] -

6.1.2 Alveolar lateral consonant : [l-], [-l-], [-l].

One voiced unaspirated alveolar lateral consonant represented by [l] occurs in all three positions, initial, intervocalic and final, as will be seen from the following examples.

Initially:	[l-] [lɔo]	'take!'
Intervocalically :	[-l-] [bɔle]	'he says'.
Finally:	[-l] [bɔl]	'say!'

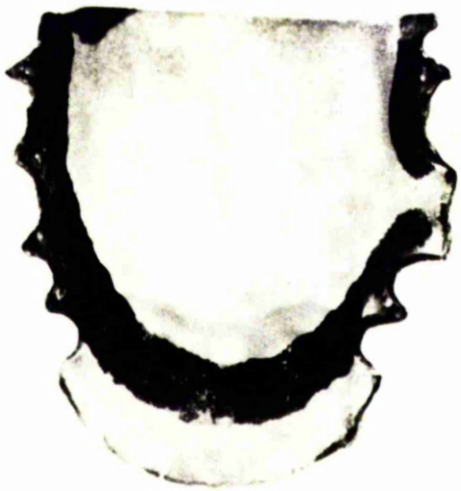
For the articulation of [l-] in the example [lɔo] the tip and blade of the tongue touch the teethridge, in the middle of the mouth there is complete closure, and a passage is left on the right side of the tongue, the outgoing air passes out laterally on that side of the tongue. The vocal cords vibrate during the articulation.

The pm. of the word [lɔo] (No.24) shows a bow-shaped wipe off across zone 3, which extends on the left and right hand sides of the median line in zone 4. The gap of wipe off on the right-hand side of the palate suggests that the air passes on that side. The articulation is more advanced in [likhi]. The pm. of [likhi](No.25) shows wipe off extending up to zone 2.

The articulation is voiced. See km. of [lɔe] (No.48)(Appendix) [l-] may be termed as a voiced alveolar lateral consonant.

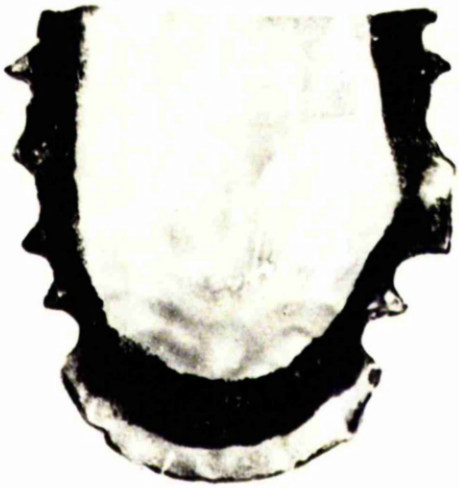
Movements of the speech organs during the articulation of [-l-] are similar to those for the initial [l-]. The pm. of [bɔlo] (No.27) shows that the wipe off is across zone 4 and

24. [lɔɔ]



25. [likhi]

26. [boli]



27. [bɔlo]

extends slightly forward than canine line.

For the articulation of [-l] in the form [bɔl] the contact is maintained for a comparatively longer duration than for the initial [l-] or intervocalic [-l-] in [lɔo] and [bɔle] respectively. Perceptually ~~At the level of perception~~ it is found to be lax. Pm. of [bɔl] (No.59) shows a wipe off covering part of zone 4 and part of zone 3. The wipe off shows that [-l] in [bɔl] is more lax in articulation than [l-] in [lɔo] or [-l-] in [bɔle].

[*l-] and [-l-] followed by a front vowel [i] is more advanced than [l-] and [-l-] followed by a back vowel [o] or [u]. See pms. [likhi](No.25), [boli](No.26) and [bɔlo](No.27),

6.1.3 Alveolar tap consonant [r-], [-r-], and [-r].

One voiced unaspirated alveolar tap consonant represented by [r] occurs in all three positions, initial, intervocalic and final, as will be seen from the following examples:

Initially :	[r-]	[rɔe]	'he lives'.
Intervocalically:	[-r-]	[pɔre]	'he wears'.
Finally :	[-r]	[pɔr]	'wear! '

For the articulation of [r-] in the example [rɔe], the tip of the tongue is raised towards the teethridge, the main body of the tongue remains in its lowered position. The sound is produced with one or two taps of the tip of the tongue against the teethridge. Vocal cords vibrate during the articulation.

The pm. of the form [rɔe](No.28) shows that the middle of the tip of the tongue does not touch behind the teeth ridge. The incomplete contact is in zone 4 where two bow shaped thin lines from the two sides come nearer but are not joined together. It shows that there is friction for initial [r-]. The articulation is voiced. See Km. of [rɔe](No. 49)(Appendix).

[r-] may be termed as a voiced tapped consonant.

A tapped [r] is represented by the symbol [ɾ] in ~~the~~ phonetic transcription, but for typographical convenience I consistently use [r].

Movements of the speech organs during the articulation of [-r-] in [pɔre] are similar to those for the initial [r-] of [rɔe], except that there is no friction as for the initial [r-]. The pm of [pɔre](No.60) shows a bow shaped wipe off of complete contact across the canine line.

In the articulation of final [-r] of the form [pɔr] movements of the speech organs are similar to those mentioned for the medial [-r-] in [pɔre] See pm. of [pɔr](No.61). The thin wipe offs meet together in zone 3.

Intervocalic [-r-] or final [r] differs from initial [r-] in that intervocalic and final [r] may have contact in central area but initial [r-] has no contact in central area.

[-r-] followed by a front vowel [i] is more advanced than [-r-] followed by a back vowel [o] or [u]. See pm. [pori] (No.29), [pɔro](No.30).

28. [rɔe]

29. [pori]

30. [poro]

For phonological purposes lateral consonant and tap consonant will be treated under the heading Liquid consonant.

6.1.4 Sibilant consonant

One sibilant consonant occurs in all three positions - initial, medial and final.

(a) Initially: [ʃ-] [ʃape]

(b) Medially: [-ʃ-] [bɔʃe]

(c) Finally : [-ʃ] [bɔʃ]

(a) Initial Sibilant

For the articulation of [ʃ-] in the example [ʃape] the tip and the blade of the tongue ~~is~~ are raised towards the hard palate just behind the teeth ridge, the main body of the tongue is raised towards the hard palate. The edge of the tongue forms contact on the sides. A narrow space is left between the teeth-ridge and the blade of the tongue, and the outgoing air passes with audible friction. The groove in the middle of the tongue is wide. The vocal cords do not vibrate.

The pm. of [ʃape](No.31) shows a contact of the edges of the tongue on the sides, between the canine line and the 1st molar line. There is a wide absence of central contact. This is a fricative articulation.

Km. of [ʃadh](No. 47)$_{\wedge}$ (Appendix) shows features of voiceless fricative articulation for the consonant of the form.

[ʃ-] may shortly be termed as voiceless palato-alveolar sibilant.

Intervocalic and final sibilant.

Movements of the speech organs during the articulation of [-ʃ-] in [bɔʃe] and [-ʃ] in [bɔʃ] are similar to those for the initial [ʃ-] in [ʃape], as will be seen from the pms. of these words. See pms. of [bɔʃo] (No.34) and [bɔʃ](No.33).

Kms. of the words show that the articulation is voiceless.

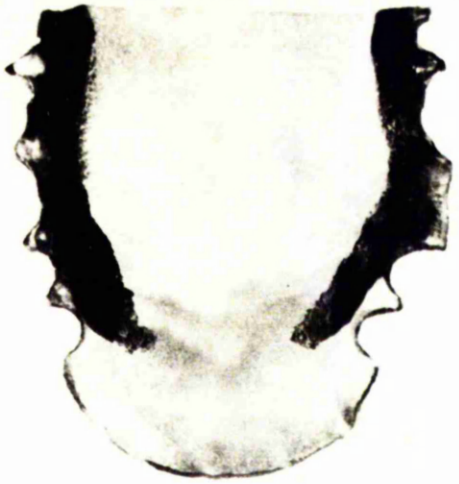
[-ʃ-] preceded and followed by a close front vowel [i] has contact further forward than when preceded and followed by a back vowel. The pm. of [miʃi](No.35) shows wipe off extending upto the canine line; the pm. of [bɔʃo](No.34) shows wipe off only just beyond the first molar line.

6.1.5 Nasal Consonants.

Like other consonants nasal consonants also occur in all three positions, initial, medial and final, as can be seen from the following examples:

(a) Initially:		Medially:		Finally:	
[n-]	[nabe]	[-n-]	[mane]	[-n]	[man]
[m-]	[mape]	[-m-]	[kɔme]	[-m]	[kɔm]
		[-ŋ-]	[bhaŋe]	[-ŋ]	[bhaŋ]

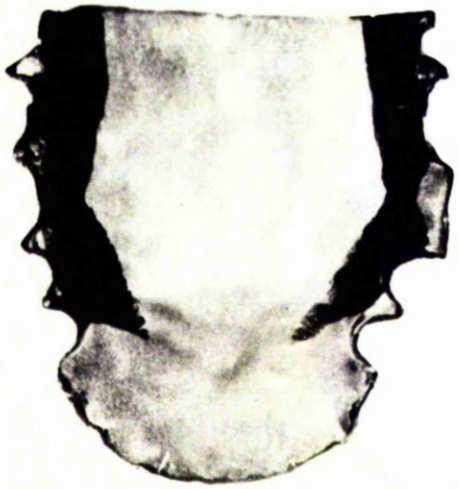
31. [ʃape]



32. [ʃobe]

33. [boʃ]

34. [boʃo]



35. [miʃi]

(a) Initial nasal consonants

Two nasal consonants occur initially. They are represented by the phonetic transcriptions [n-] and [m-].

For the articulation of [n-] in the example [nabe] the mouth passage is completely blocked by the contact of the tip and blade of the tongue against the alveolar region, the soft palate remains in its lowered position and the out going air passes through the nose with audible nasality.

The pm. of the form [nabe](No.36) shows a complete bow-shaped wipe off which extends from slightly below the 1st molar line to slightly above the lateral incisor line and covers part of zone 4 and part of zone 3. The type of wipe off associated with an apical contact in the alveolar region is found to be typical of initial [n-], intervocalic [-n-] and final [-n]. See pm. of [ane](No.37), and [man] (No.38). In some pms. of the forms with initial [n-] the wipe off extends further forward so as to cover the whole area of zone 3. See pm. of [nibi](No. 39). The wipe off has touched the lateral incisor line but has not crossed it. In any case the contact is alveolar and not dental as is suggested in the traditional grammars by the label 'dantya na'.

M.A.Hai while giving an account of the alveolar nasal consonant in his own pronunciation, observes that [n-] in [nap] shows wider wipe off covering zone 2 and ascribes this to the tense articulation, For final [-n] in [man] and medial [-n-] in [mana] he has the same type of wipe offs

confined to zone 3, which 'touched lateral incisor line but had not crossed it.'[1]

In my pronunciation [n] in all three positions, initial, intervocalic and final, gives the same type of wipe off covering a part of zone 4 and extending upto certain portions of zone 3. And although in some cases (with a following close front vowel [i], for example, [nibi]) the wipe off may touch the lateral incisor line it does not cross it. In any case it never extends up to zone 2.

As regards the tenseness or laxness in the articulation M.A. Hai suggests that [n-] in [nap] is tense and [-n] in [man] is lax and [-n-] in [mane] is more lax.[2]

At the level of perception, in my pronunciation, of the initial [n-] in [nabe] and final [-n] in [man], greater tenseness of the muscles is observed than intervocalic [-n-] in [ane]. This muscular tenseness or laxness can sometimes be shown to correlate in palatograms with a wider area of wipe off; cf. the pms. of [nibi](No.39) and [ane](No.37

The km. of [nabe] shows that the articulation of the word as a whole is voiced, and that the amplitude is the greatest in the wave form on the N tracing during the period of closure.

In general phonetic terms [n-] may be described as a voiced apico-alveolar nasal consonant.

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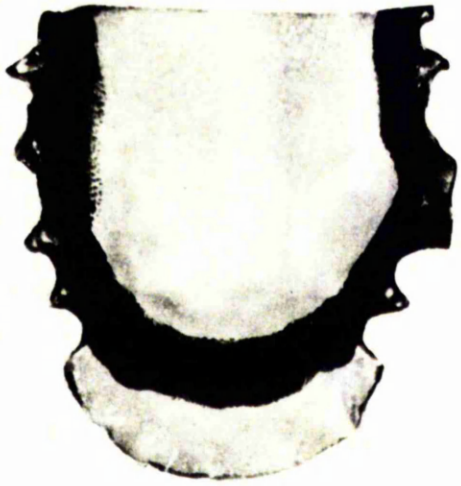
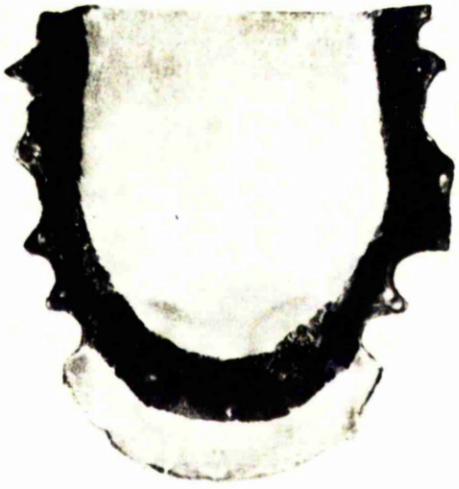
1. M.A.Hai 'Nasals and Nasalization in Bengali,' Dacca University, 1960, p.126 ff. and also p.211 ff.
2. Ibid.

36. [nabe]



37. [ane]

38. [man]



39. [nibi]

For the articulation of [m-] in the example [mape] the lips are closed and the outgoing air passes through the nose producing audible nasality.

The forms with [m-] do not show any wipe off on the artificial palate. [m-] may be described as a voiced bilabial nasal consonant.

Kms. of the forms beginning with a nasal consonant show that the onset of wave forms on the N tracing precedes in point of time the onset of wave forms in the M tracing. See kms. of [nace](No.2)(P137A) and [mat](No.8)(144A). Maximum nasality, as seen in the greatest amplitude of the wave forms in the N tracing continues with the gradual diminution throughout the following open phase. It shows that the raising of the soft palate is not simultaneous with the release of the oral occlusion and nasality continues until the articulating organs have achieved a complete velic closure. Such a profile as this in the nasal tracing is considered typical of the initial nasal consonant articulation.

(b) Medial nasal consonants

Three nasal consonants are found in the medial position. They are represented by the phonetic transcriptions [-ŋ-], [-n-], [-m-]. and

During the articulation of [-ŋ-] in the example [bhaŋi] the mouth passage is completely blocked by the contact of the back of the tongue against the velum.

The pm. of [bhaŋi](No.40)(Appendix 176A) shows contact in the two corners of the back of the artificial palate, which extend

laterally from the base line to the 2nd molar line.[1] There is a tendency of linking the two bits of wipe off in the two corners on the middle of the hard palate. This shows that the back of the tongue is raised behind the hard palate but does not always reach the artificial palate to leave any wipe off in the middle.

The km. tracings of [bhaŋe](No. 79 (Appendix)) show that there is the highest amplitude of prominent wave form in the N tracing during the stop phase in the M tracing marked between the points X and Y, which correspond with vocalic closure for the medial velar nasal [-ŋ-].

This [-ŋ-] may be defined as a voiced velar nasal.

The movements of the speech organs during articulation of [-n-] and [-m-] are similar to those which they make during the articulation of initial nasal consonants, except that there is less muscular tenseness in the articulation of [ane] than [nabe].[2] Compare the pms. of [nabe](No.36) and [ane](No.37)(1734). They show almost the same area of apice alveolar contact for the initial [n-] and medial [-n-].

The kms. of [ane](No.79) and [jome](No.75), (Appendix) show similar feature of nasality and voicing.

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1. M.A.Hai op.cit., 163. has the same feature. His pm.No.6.of [maŋi] in p.131.
2. M.A.Hai has wipe off on the pm. confined to zone 3, which correlate with lax articulation of [-n-] (See M.A.Hai, op.cit., 131).

(c) Final nasal consonants

The articulation of final [-ŋ] in [bhaŋ] shows similar phonetic features as have been observed in the case of [-ŋ-] in [bhaŋi] except that the final [-ŋ] is not released orally and the contact is maintained while the air c ontinues to escape through the nose. The pm. of [bhaŋ](No.41) shows two bits of wipe off in the two corners of the back of the artificial palate, which does not cross the 4th molar line. This correlates with the lax articulation. I also perceive that in the articulation of both final [-ŋ] in [bhaŋ] and medial [-ŋ-] in [bhaŋi] there is muscular laxness.[1]

In the articulation of final [-n] and [-m] the place and manner of articulation are same as for initial [n-] and [m-] with the difference that final [-n] and [-m] are not released orally.

The pm. of the form [man](No.38) shows a complete bow shaped wipe off across the canine line covering a part of zone 4 and part of zone 3. This shows that in the articulation of [-n], the tongue makes a contact which is similar to that of [n-] in [nabe] or [-n-] in [ane]. This type of wipe off illustrates an apical contact in alveolar region. The final [-n] also, may be defined in general phonetic terms, as a voiced apico-alveolar nasal.[2]

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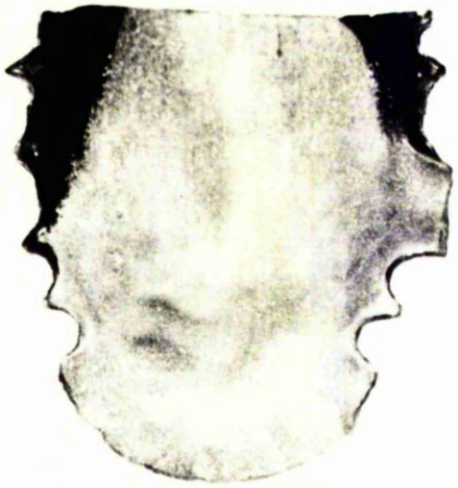
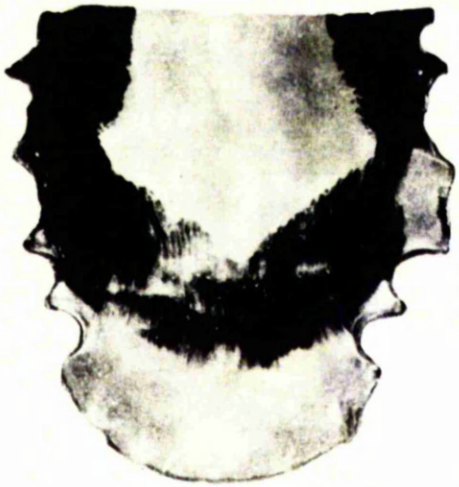
1. M.A.Hai, observes different features. For final [-ŋ] he has graeter muscular tenseness than for intervocalic [-ŋ-]. See M.A. Hai op.cit., p.131. (pm.3,5,6.)
2. Supra.

40. [bhaɲi]



41. [bhaɲ]

42. [poɽi]



43. [poɽo]

Kms. of [bhaŋ] (No. 66) (Appendix), [ʃon] (No. 12) (144A) and [jɔm] (no. 67) (Appendix) show greater amplitude on N tracing during the stop-phase in the M tracing.

Thus, to sum up, the following are the simple nasal consonants: Initially : [n-], [m-], intervocalically: [-ŋ-], [-n-], [-m-], finally : [-ŋ], [-n], [-m].

6.1.6 The Flapped Consonant : [ɽ]

Bengali verbal forms have an unaspirated[1] voiced flapped sound represented by [ɽ]. This occurs in intervocalic and final positions. This is a non-fricative flapped sound in the articulation of which the tip of the tongue curls back and flaps forward, to touch behind the teethridge, and then moves down and lies flat. The movement starts with lateral contraction of the tongue which is drawn back and ends with the fore part spread out when it flaps down and lies flat. The soft palate is raised and the vocal cords vibrate from the beginning.[2]

The pm. No. 42 of [poɽo] shows a fairly wide band of wipe off from slightly below the second molar line up to the

1. An aspirated flapped sound [-ɽh-] is also observed in the pronunciation of some speakers, which can be taken as dialectal variation. Example: [kak ra kaɽhe] 'The crow caws'. Usual pronunciation of speakers is [kaɽe]. See S.K. Chatterji, A Bengali Phonetic Reader, p. 15, § 26.
2. See the description of the Tamil retroflex flapped ɻ in Firth's Tamil phonetics in Appendix to Arden's Tamil Grammar, p. viii and xv. See also, W.S. Allen, Some Phonological characteristics of Rajasthani. B.S.O.A.S., 1957, xx, § 3.

canine line, thus covering the whole area of zones 4 and 5 and a part of zone 6 on the two sides of the median line. The pm. (No.43)of [pɒɽɒ] shows a more thin wipe off covering only the whole of zone 4. In none of the pms. are there ~~are~~ clean wipe offs of a complete contact. There are marks of curled-back tongue-tip coming forward from the upward position. That is, in the wipe offs there are signs of brushing off the chalk from the artificial palate. The small patches of wipe offs show that the curled-back tongue-tip touches at that point.

In both the pms. the main area of contact is within zone 5 and 4, which shows that the contact is post alveolar.

Palatograms of the utterances involving final [-ɽ] show wipe offs of similar nature covering an area between the second molar line and the canine line.

An intervocalic [-ɽ-] has greater force and more retroflexion in its articulation than final [-ɽ]. This can not be shown in pm., but can be observed at the perception level.

In general phonetic terms [-ɽ-] and [-ɽ] are described as voiced apico-post alveolar-retroflex flapped consonants.

Km. of the word [pɒɽe] (No.50) shows that the articulation is voiced and unaspirated.

It has been seen that the retroflex voiceless consonants [ʈ] and [ʈh] occur in all three positions, initially, intervocalically, and finally[1] and retroflex voiced consonants [ɖ-] and [ɖh-] occur only word initially and never intervocalically or finally. The flapped consonant [ɽ] occurs medially

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1. Supra. See pp. 154 ff.

and finally in a word and never initially in the same environment. Aspirated flapped [ɽh] is not found in Bengali verbal forms.

The retroflexion and dark colouring of the articulation are an important feature in the pronunciation of the flapped consonant. This phonetic colouration of the syllable consisting of [-ɽ-] or [-ɽ] requires phonologically the setting up of retroflexion as a prosodic element of structure. And in doing so such syllables are included as being similar, considering the distributional restriction and positional variation, to those with other retroflex articulations, e.g. [ʈ], [ʈh], [ɖ], [ɖh].

6.2 Complex Consonantal articulations.

6.2.0 Combinations of two adjacent consonants, I propose to divide into two types: Interword and Intraword Combinations.

6.2.1 Interword Combinations

Whenever two consonants occur adjacently at the junction of two words in a phrase the combination is interword, e.g. [-ɖb-] in [ʃe paɖ boe] 'he carries jute', [-tr-] in [ʃe bhat rãdhe] 'she cooks food'.

There are interword consonant sequences at the external junction of a verbal form and a form in other word classes, i.e. a non-verbal form preceding or following it.

Where the final consonant of the preceding form in

other word classes and the initial consonant of the first form of the verbal piece constitute a consonant sequence, it is called a preverbal interword consonantal sequence.[1]

Thus, we have [ʃe paɖ bɐe] 'he carries jute'. Here [b-] which constitutes the initial consonant of the verbal form [bɐe] forms the second part of the -CC- sequence at the external junction where the first -C- is a [-ɖ] the final consonant of the non-verbal form [paɖ]. The sequence is [-ɖb-].

Where a finite verbal form preceded another word and the final C of the verbal form makes the initial component of the -CC- sequence and the initial C- of the following word forms the second component, it forms a post verbal interword consonantal sequence.

Thus, in [cɔl baɽi] 'let us go home', [-lb-] form a consonant sequence at the external junction. The final consonant [-l] in the verbal form [cɔl] forms the initial component and the initial consonant [b-] of [baɽi] which is a nominal form, forms the final component.

In both preverbal and post-verbal consonant sequences, aspirated voiced retroflex plosive [-ɖh-] as the first component and the velar nasal [-ŋ-] and the retroflex flapped [-ɽ-] as the second component do not occur. In addition, in

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1. For the terms 'consonant sequence', 'consonant clusters' see:
C.F.Hockett : Manual of phonology, index ;
Heffner : General Phonetics, p.195:
D.Jones : Phoneme, its Nature and Use.p. 5;
K.L.Pike: Phonemics, p.131.

post-verbal interword sequences the velar aspirated voiced plosive [-gh] and the bilabial aspirated voiceless and voiced plosive [-ph] and [bh] do not occur as the initial component. Any other consonant can occur as either of the components.

In post verbal -CC- sequences a conjunct consonant as the final component can occur. This is found with some rare Sanskrit tatsama or English loan words as a post verbal form. e.g. [ʃe jak skule] 'let him go to school'. [jak klanti] 'let all fatigues be relieved'. Consonants in all other sequences are simple and never conjunct.

It should be noted that there are no interword sequences between different verbal forms (i.e. between two non-finites or a non-finite and finite) in a single verbal piece in a non-emphatic simple sentence where the finite verbal form usually occurs at the sentence final position, for final syllables of non-finite verbal forms are always open. e.g. [nɔuko khani dekte dekte cɔle gelo] 'the boat passed along quickly'.

But in a Compound verbal[1] sentence where the two finite verbal forms occur adjacently, or in an emphatic style where a non-finite verbal form follows the finite verbal form, there are consonant sequences at the external junction of the two verbal forms. The final consonant of the first form and the initial consonant of the following form constitute a consonant sequence.

Thus, in [cɔl jai] 'let us go' [-lj-] form a consonant sequence at the external junction of the finite verbal forms

1. ~~B.N.I.~~ See §3.0.2.2. and Footnote 1, on p. 39

[cɔl] and [jai], and in [dæg gie] 'go and see' [-gg-] form a -CC- sequence at the external junction of the finite and non-finite verbal forms [dæg] and [gie] respectively.

In these consonantal sequences in the junction of the two verbal forms, finite and finite, or non-finite and finite, the distribution of consonants is similar to that of post verbal interword sequences, except that there is no possibility of a conjunct consonant occuring as the second component. The statements for type two (post verbal sequences) hold good for this type of sequences.

For phonological purposes interword -CC- sequences will be written with a space between them. e.g. in [jak rekhe] 'let him leave it and go' the consonant sequence will be written as - C C - in the generalized phonological formulae.

6.2.2. Intraword consonantal combinations

Whenever two consonants occur adjacently within a verbal form they make an intraword consonantal combination. e.g. [-ɖb-] in [ʃe gachʈi kaɖbe] 'he will cut the tree'.

Combinations of consonants within a verbal form are never found in the initial position, nor they are found in the morphological abstraction, which I call, ending. They occur either in the stem final position or at the junction of the stem and ending, or in the case of reduplicated forms at the junction of the two stem syllables.

These combinations of consonant are of the following

types:

Within Morpheme:

(i) Consonant clusters within the structure of the stem.

(ii) Consonant sequences in the junction of the stem syllables in the reduplicated forms.

At Morpheme boundary:

(i) Consonant sequences in the stem and ending junction of the forms whose stem final and ending initial elements are C.

(ii) Geminated clusters in the stem and ending junction of the forms, whose stem syllables are open and the ending initial consonant is [-ch-].

6.2.2.1 Consonant Clusters within the structure of the stem.

Clusters are defined as a consonant group occuring in the dissyllabic stem patterns CVCCə- and VCCə-only.

A cluster as a whole or a part of it is characterized by voicing or voicelessness, aspiration or absence of it in articulation. Clusters are marked -$\widehat{CC}$- in the phonological formulae. Thus, [-mɽ-] in [kamɽae] 'he bites' is a cluster phonologically marked as -$\widehat{CC}$- in the generalized structure CV$\widehat{CC}$ə-V . The stem-ending division is shown in the formula with a hyphen.

In Bengali orthography usually these clusters are represented by ligatures, and occasionally by placing a

'həsəntə' sign below the first consonant.

In transliteration the ligature will be marked with a bracket over the symbols representing the cluster. Where 'həsəntə' is used in orthography the həsəntə sign below the first consonant in the cluster is used consistently. Thus, [ulṭae] is transliterated as ul͡ṭae or ul͜ṭae.

Clusters are divided into two groups: Homorganic and heterorganic.

6.2.2.1.1 Homorganic clusters.

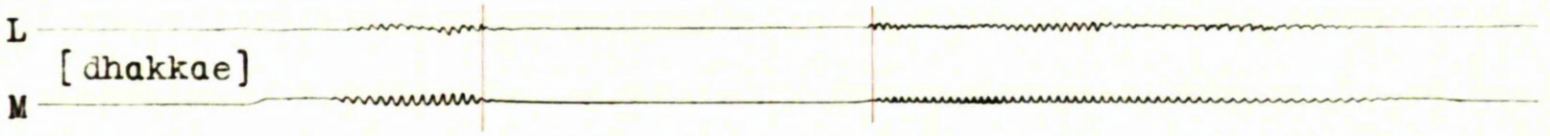
They form the following patterns:

1. Plosive Plosive.
2. Liquid Liquid.
3. Nasal Plosive.

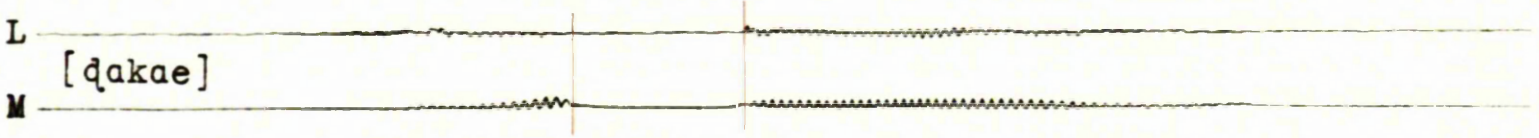
1. Unaspirated voiceless velar plosives [-kk-]- [dhakkae]
2. Unaspirated voiced palato-alvelar plosives [-jj-] -[ajjae]
3. Unaspirated voiced alveolar laterals [-ll-] -[cillae].
4. Retroflex nasal and retroflex voiced plosive [-ɳɖ-] - [khoɳɖae].

The articulation of [dhakkae] and [cillae] show that these homorganic clusters are realized with greater energy and force of exhalation than simple consonant and that the contact is maintained without any change in position for a longer duration before it is released. Kms. of the words [dhakkae] (No.21) and [ɖakae](No.22) and [cillae](No.37) and [chilae](No. 38)

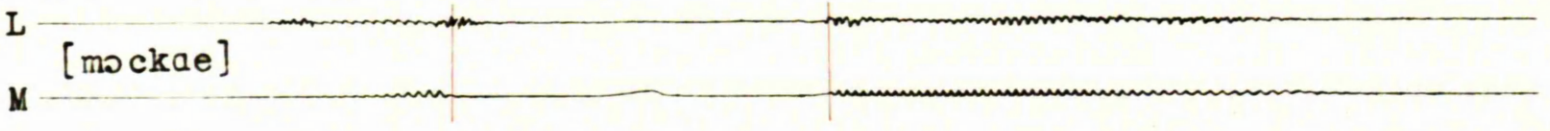
21. [dhakkae]

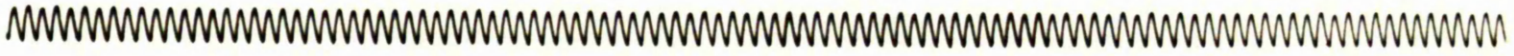


22. [ɖakae]



23. [mɔckae]





show that for the simple consonant [-k-] in [qakae] and [-l-] in [chilae] the tongue is held for a shorter duration than for the homorganic cluster [-kk-] and [-ll-] in [dhakkae] and [cillae] respectively. In articulating these homorganic clusters, the muscular tension and the firmer contact of the articulating organs are observed. The palatogram of [cillae] gives over-lapping wipe offs of the contact of the alveolo-palatal plosive and lateral. The palatograms of [mille](No.63) and [mile](No.62) can be compared. These pms. show different wipe offs for the homorganic long lateral and the simple lateral articulations. This indicates that[-ll-] has a more tense contact than[-l-].

6.2.2.1.2 Heterorganic clusters.

Heterorganic consonant clusters within the stem in the dissyllabic stem patterns CVC͡Cə- and VC͡Cə- form the following patterns:

1. Plosive plosive
2. Plosive Liquid
3. Plosive Sibilant
4. Plosive Nasal
5. Liquid Plosive

6. **Liquid Sibilant**
7. Liquid Nasal
8. Sibilant plosive
9. Sibilant Liquid
10. Nasal plosive
11. Nasal Liquid
12. Nasal Sibilant
13. Nasal Nasal

They are listed below with examples.

PLEASE TURN OVER

	Voiceless throughout	voiced voiceless	voiced throughout	voiceless voiced
1. Plosive plosive				
(i) Alveolo palatal-Velar	[-ck-] [mɔckae]	-	-	-
(ii) " Retroflex	[-cʈ-] [kɔcʈae]	-	[pĩjɽae]	[-cɽ-] [-chɽ-] [mɔcɽae] [achɽae] 1
(iii) Retroflex-Velar	[-ʈk-] [mɔʈkae]	[-ɽk-] [bhɔɽkae]	-	-
(iv) " Bilabial	-	[-ɽp-] [tɔɽpae]	-	-
(v) Dental Velar	[-tk-] [ãtkae]	-	-	-
(vi) Bilabial Velar	[-pk-] [ʈɔpkae]	-	-	-
(vii) ,, Alveolo-palatal	[-pc-] [kɔpcae]	-	-	-
(viii) " Retroflex	[-pʈ-] [jhapʈae]	-	[-bɽ-] [ghabɽae]	[-pɽ-] [cipɽae]
(ix) Velar Retroflex	-	-	[-gɽ-] [bigɽae]	[-kɽ-] [ãkɽae]
(x) Dental"	-	-	[-dɽ-] [khedɽae]	[-tɽ-] [hatɽae]

1. See para two on page 423.

cont.

2. Plosive Liquid				
(i) Velar-Lateral	-	-	[-gl-] [uglae]	[-kl-] [piklae]
(ii) Velar Tap	-	-	-	[-kr-] [ʈhokrae]
(iii) Alveolo-palatal Lateral	-	-	[jl-] [khujlae]	[-cl-] [kɔclae]
(iv) " Tap	-	-	[-jr-] [gɔjrae]	-
(v) Dental Lateral	-	-	[-dl-] [kodlae] bɔdlae	[-tl-] [ʃãtlae]
(vi) " Tap	-	-	[-dr-] [ʃodrae]	[tr-] [ʃãtrae]
(vii) Bilabial Lateral	-	-	[-bl-] [choblae]	-
(viii) Bilabial Tap	-	-	[-br̥-] [bhæbrae]	
3. Plosive Sibilant				
(i)Velar-Palato-alveolar	[-kʃ-] [cɔkʃae]	-	-	-
(ii) Bilabial "	[-pʃ-] [cupʃae]	-	-	-

cont.

4. Plosive-Nasal				
Velar - Alveolar	-	-	[-gn-] [lɔgnae]	-
5. Liquid - Plosive				
(i) Lateral velar	-	-	[-lg-] [algae]	[-lk-] [culkae]
(ii) " Retroflex				[-lʈ-] [ulʈae]
(iii) Tap-Dental	-	-	-	[-rt-] [bɔrtae]
(iv) Tap-Alveolo-palatal	-	-	[-rj-] [gɔrjae]	-
5. Liquid-Sibilant				
(i) Lateral-Palato-alveolar	-	-	-	[-lʃ-] [jhɔlʃae]
(ii) Tap Palato-alveolar	-	-	-	[-rʃ-] [ɔrʃae]
7. Liquid-Nasal				
Tap-Bilabial	-	-	[-rm-] [gɔrmae]	-

cont.

8. Sibilant Plosive				
(i) Palato-alveolar Velar	[-ʃk-] [phɔʃkae]	-	-	-
(ii) Retro-flex Retro-flex.	[- ʂʈ-] [ghɔʂʈae]	[- ʂɽ-] [ghɔʂɽae]	-	-
(iii) Alveolar Dental	[-st-] [postae]	-	-	-
9. Sibilant-Liquid				
(i) Palato-alveolar Lateral	-	[-ʃl-] [phuʃlae]	-	-
(ii) Palato alveolar Tap	-	[-ʃr-] [muʃrae]	-	-
10. Nasal plosive				
(i) Bilabial Velar	-	[-mk-] [cɔmkae]	-	-
(ii) " Alveo-lo-Palatal	-	[-mc-] [khamcae]	[-mj-] [ʃɔmjae]	-
"	-	-	[-mjh-] [ʃɔmjhae]	
(iii) " Retroflex	-	[-mʈ-] [cimʈae]	[-mɽ-] [kamɽae]	
(iv) Alveolar Velar	-	[-nk-] [phonkae]	-	-

cont.

(v) Velar - Alveolo-palatal	-	[-ŋc-] [bhœŋcae]	-	-
(vi)Velar Retroflex	-	-	[-ŋɽ-] [niŋɽae]	-
11. Nasal - Liquid				
(i)Bilabial - Lateral	-	-	[-ml-] [ʃamlae]	
(ii) " - ap	-	-	[-mr-] [cumrae]	
(iii)Velar - Lateral	-	-	[-ŋl-] [haŋlae]	
12. Nasal - Sibilant				
(i)Bilabial-Palato alveolar	-	[-mʃ-] [dhɔmʃae]	-	-
(ii)Alveolar Palato-alveolar	-	[-nʃ-] [khunʃae]	-	-
(iii) Velar-Palato-alveolar	-	[-ŋʃ-] [ɖɔŋʃae]	-	-
13. Nasal-Nasal	-	-	[-nm-] [jɔnmae]	-
(i) Alveolar-Bilabial.				

There are no Sibilant Nasal patterns of combination in these types of cluster.

Clusters that do not involve a nasal consonant may be wholly or in part voiced or voiceless and aspirated or unaspirated in articulation. With a few exceptions, almosy any unaspirated Plosive, Liquid and Sibilant may form either of the two components, but their combination possibilities are restricted.

During the articulation of a consonantal cluster the position of contact for the second component of the cluster is taken up by the articulatory organs simultaneously with the release of the position of contact for the first component.[1]

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1. "In the articulation of the sequences of -pṭ- (as in <u>nepṭa</u>: wrap), -ṭk- (as in mɔṭka: crack fingers), the first consonant like 'halanta consonant' of skt is not followed by a vowel and is not fully exploded either. The contact is first made at one place and before it is released the articulatory organs abruptly take positions for the following consonant. This according to the Indian grammarians may be termed Abhinidhana." (See M.A.Hai, <u>op.cit.</u>, §197).

"The pratisakhyas and the carayania siksa describe the phenomenon of incomplete articulation, which has been generally called "Abhinidhana". The phenomenon as described in the Rg. Prat (VI.5) consists in the repressing or obscuring of a plosive...before another plosive or a pause. The sound displaying this phenomenon is said to be pressed (piditah), quite weakened (sannatarah) and lacking in breath and voice (hinas vasanadah). The term commonly used for this phenomenon is Ahbinidhana, which etymologically means "adjacent imposition"...According to both the Rg. and the Atharva pratisakhyas, and the carayaniy siksa, a plosive followed by another plosive underwent Abhinidhana; thus in arvagdevah, g before d was said to be obscurely pronounced; similarly, d before bh in marudbhih... In the actual pronunciation of the language there was a tendency to explode a plosive incompletely before another plosive, as the English do in words like "act", "employ", "begged". (See Siddheswar Varma, <u>Critical Studies in the phonetic observations of Indian Grammarians</u>, p.137,ff.

Where the articulations concerned involve stop consonants the speech organs have energetic movements. The articulatory organs are held high for a longer duration. This longer duration in the stop phase is observable in the km. tracings. See km. for [mɔckae] (No.23). This km. can be compared with the kms. of [kace](No.34) and [ɖakae](No.22) which involve simple consonantal articulation. Duration for [-ck-] in [mɔckae] is 28 c.s., for [-c-] in [nace] is 16 c.s. and [-k-] in [ɖakae] is 13 c.s. These kms. also show that the articulation is voiceless during the stop phase.

Clusters involving nasal consonants are of three types -N͡C- -C͡N- and -N͡N-. In all three types the articulation is heterorganic. These clusters are all characterized by absence of breathiness in articulation. Where the second -C- element is voiced the whole cluster is characterized by voicing, where the second -C- is a voiceless consonant, the later part of the closure for the cluster is voiceless.

See km. of [ʃɔmjae](No.53) and [khamcae](No.54). (Appendix)

In -NC- clusters nasality partially affects the preceding vocalic articulation. See km. of [kamɽae](No.68) and [cimʈae] (No.69). (Appendix) In the nasal tracings of [kamɽae] and [ʃamlae] there is a greater amplitude of wave forms during the period of closure, which dies down gradually during the later part of the closure in the mouth tracing. These feeble wave forms in the N tracing during the later part of the closure is associated with the non-nasal voiced consonantal articulation [-ɽ-] and [-l

respectively. In the case of [cimʈae] and [cɔmkae] the amplitude during the later part of the closure in the nasal tracing is minimum.

The consonant of the -NC- clusters where N is a bilabial nasal [-m-], is a plosive other than bilabial, that is, [-k-], [-c-], [-j-], [-ʈ-], [-ɽ-]; liquid [-r-]; and sibilant [-ʃ-].

In -NN- cluster, the initial -N- is alveolar nasal consonant and the final -N- is bilabial nasal consonant. The soft palate is lowered not only during the closure for the articulation of the cluster but also from the preceding vocalic articulation to the following vowel. See km. of [jɔnmae] (No. 70) (appendix). The articulation as a whole is voiced.

6.2.2.2 Reduplicated stem sequences

Reduplicated stem sequences involve the verbal forms in trisyllabic stem pattern CVC/CVCə-. These types of verbal form have all the characteristics of dissyllabic stem patterns where the feature of the linking of stem and ending is syllabic. Thus the generalized structure of the form [piʈpiʈae] is CVC/CVCə-V. The stem and ending division is shown by a hyphen.

Usually syllable one as a whole or a part of it is repeated or chimed. That is to say, there is a regular relation between the two Vs, and between the first and the third C's and between the second and the fourth C's in the structure. If the Cs and Vs involved in the structure are

numbered as C_1 V_1 C_2 C_3 V_2 C_4 e. $V_2$and C_4 are found identical with V_1 and C_2; C_1 and C_3 may or may not always be identical. Thus, in [pitpitae], C_1 and C_3 , and C_2 and C_4, and the two Vs are the same. That is, syllable one as a whole is repeated. In [culbulae] the two vs and C_2 and C_4 in the two syllables are the same but C_1 is a [c-] and C_3 is a [-b-]. There is no particular rule controlling this distribution of c_1 and c_3 where they are not the same, but there are restrictions as to the chiming of the two syllables. For convenience, forms in this pattern are referred to as reduplicated forms.

The sequences of the two C elements involve C_2 and C_3 that is, the final c of the initial syllable and the initial C of syllable two. It has been seen that the final consonantal element of the initial syllable is invariably the same as the final C element of syllable two and that it forms the first part of the -CC- sequence, but the second C element in the sequence is not always the same as initial C element of the syllable one. This sequence is, to some extent, similar to that of an interword consonant sequences on the one hand, and intraword consonant clusters within the morpheme of stem on the other. These are better treated as reduplicated stem sequences rather than clusters. It has also been seen that the syllable one is always closed, and never open, and the initial consonant of the second syllable is pronounced without release of the preceding consonantal articulation. That is to say, the articulating organ take position simultaneously for the second consonant before the release of the first.

These sequences involve the following patterns:

1. Plosive Plosive
2. Plosive Liquid
3. Plosive Nasal
4. Liquid Plosive
5. Liquid Sibilant
6. Liquid Nasal
7. Sibilant Plosive
8. Sibilant Nasal
9. Nasal Plosive
10. Nasal Sibilant
11. Nasal Nasal

There is no plosive-sibilant, Sibilant liquid, or nasal liquid combination in this type of sequence. They are listed below with examples:

1. Plosive Plosive	Voiceless throughout	Voiced Voiceless	Voiced throughout	Voiceless Voiced
(i) Dental Bilabial	[-tp-] [pɔtpɔtie]	-	-	-
(ii) Retroflex Bilabial.	[-ʈp-] [piʈpiʈie]	[-ʈph-] [phɔʈphɔʈie]	-	-
(iii) Velar	[-ʈk-] [kɔʈkɔʈie]	-	-	-

2. Plosive Liquid				
Velar Lateral	-	-	-	[-kl-] [liklikie]
3. Plosive Nasal				
Retroflex Bilabial	-	-	-	[-ʈm-] [miʈmiʈie]
4. Liquid Plosive				
(i) Lateral Velar	-	[-lk-] [kɔlkɔlie]	-	-
(ii) Lateral Alveolo palatal	-	[-lc-] [culculie]	-	-
(iii) Lateral Bilabial	-	[-lch-] [chɔlchɔlie]	[-lb-] [culbulie]	-
(iv) Tap - Dental	-	[-rt-] [tɔrtɔrie]	-	-
(v) Tap - Alveolo-palatal	-	-	[-rjh-] [jhirjhirie]	-
5. Liquid Sibilant			-	
Tap-palato-alveolar	-	[-rʃ-] [ʃirʃirie]	-	-
6. Liquid Nasal				
(i) Lateral Bilabial	-	-	[-lm-] [jhilmilie]	

(ii)Tap Bilabial	-	-	[-rm-] [mərmərie]	
7.Sibilant-Plosive				
Palato-alveolar-Velar	-	-	-	[-ʃgh-] [ghəʃghəʃie]
8.Sibilant-Nasal				
palato-alveolar-Bilabial	-	-	-	[-ʃm-] [məʃməʃie]
9.Nasal - Plosive				
(i)Alveolar Velar	-	-	[-ng-] [gungunie] [-ngh-] [ghenghenie]	
(ii)"Alveolo-palatal	-	-	[-njh-] [jhənjhənie]	
(iii)"Retro-flex	-	[-nʈ-] [ʈunʈunie]	-	-
(iv) "Bilab-ial	-	[-nɒ-] [penpenie]		
(v)Bilabial-Alveo palatal	-	-	[-mjh-] [jhəmjhəmie]	
10.Nasal Sibilant				
Alveolar Palato-alveolar	-	[-nʃ-] [ʃənʃənie]		
11.Nasal-Nasal				
Alveolar - Bilabial	-	-	[-nm-] [minminie]	

One characteristic feature of the sequences of this type is that the second consonant is either breathy or non-breathy in articulation. A sequence as a whole or a part of it is voiced or voiceless. The articulation concerned is always non-homorganic. The combination possibilities are open, except that the velar nasal [-ŋ-] and retroflex flapped [-ɽ-] do not occur as the second component of the -C/C- sequence.

Sequences in reduplicated stem involving nasal consonants are of three types: -N/C- -C/N- and -N/N-. The articulation is always non-homorganic. Bilabial and alveolar nasal consonants [-m-] and [-n-] are found as -N- in -N/C-, and -C- is a term in the plosive and sibilant system. Where the post nasal element is voiced the articulation is voiced throughout, and where it is voiceless, the first part of the closure is voiceless. Where the post nasal plosive articulation is aspirated, the aspiration is observed during the plosive release.

See. for example, the kms. of [ʈunʈunde](No.55) and [jhɔmjhɔmie](No.56)(Appendix)

In a -C/N- sequence plosive, liquid and sibilant constitute the first component, and -N- is a bilabial ~~and~~ or alveolar consonant. The articulation as a whole is non-breathy. Where the pre-nasal consonant is voiced, voicing is maintained throughout the whole period of closure. Nasality affects the following vowel articulation. Where the pre-nasal consonant is voiceless the first part of the closure is voiceless.

Like the -NN- cluster in the dissyllabic stem pattern, -N/N- in a reduplicated stem is a non-homorganic sequence, the articulation being an alveolar nasal followed by a bilabial nasal consonant. The whole sequence is non-breathy and voiced. In this case nasality is a feature not only of the whole of -N/N- sequence, but of the whole word which extends right from the preceding syllable to the following syllable.

See km. of [minminie] (No.71) (appendix)

For phonological purposes this sequence will be marked by an oblique bar in between the two Cs. thus [pitpitie] will be denoted in the generalized formula as CVC/CVC○ V.

6.2.2.3 Consonant sequences in the stem and ending junction of the forms whose stem-final and ending initial elements are C.

Stem-ending consonant sequences are found in the junction of the forms whose stem-final and ending initial elements are a C. These are found only with the monosyllabic stem patterns CVC- and VC-.

Four consonants [-ch-], [-t-], [-b-], and [-l-] are found as initial consonants of the endings which concerns these sequences.

It is important to note that structurally clusters and sequences are different. Thus, the articulations of the consonantal combinations [-bl-] in [bhabli] and [choblie] are

phonetically similar to each other. But [-l-] in [bhabli] is one of the four ending initial consonants [-ch-], [-t-], [-b-] and [-l-], whereas [-l-] in [choblie] is one of the final components of -C͡C- clusters, where as many as 55 clusters are possible.

Another point of distinction is that the sequence [-bl-] in the form [bhabli] where two -CC- components are stated form part of two grammatical structures, namely, stem and ending. And the linking feature of these two structures, stem and ending is never syllabic.

In the form [choblie], where the -C͡C- cluster is stated, [-bl-] is always a part of the dissyllabic stem-structure, and the stem and ending linking feature in this case is always syllabic.

For phonological purposes stem-ending division will be shown by a hyphen between them.

Thus, the morphological divisions of the stem and ending of the two forms [bhabli] and [choblie] can phonologically be shown as CVC-CV and CVC͡Cə-V respectively.

6.2.2.3.1.

Homorganic stem-ending sequences.

Homorganic stem-ending sequences form the following phonetic patterns.

Plosive-Plosive

1.	Alveolo-palatal affricated	plosive	[-cch-]
2.	Dental	"	[-tt-]
3.	Bilabial	"	[-bb-]

Liquid Liquid

4.	Alveolar	lateral	[-ll-]

Nasal Plosive

5.	Bilabial nasal	plosive	[-mb-]
6.	Dental nasal	plosive	[-nt-]

1.	[-cch-]	[kacche] [pocche] [bucche] [becche] [bhicche]
2.	[-tt-]	[patte] [mɔtte] [potte] [jutte] [jitte]
3.	[-bb-]	[jɔbbe] [mabbe] [qubbe] [nibbe]

4.	[-ll-]	[tulle]
		[bolle]
		[khelle]
		[mille]
5.	[-mb-]	[jɔmbe]
		[thambe]
		[nambe]
6.	[-nt-]	[jante]
		[mante]
		[kinte]

These homorganic consonant sequences are realized with greater energy and force of exhalation than simple consonants. The contact is maintained without any change in position for a longer duration before it is released. The articulating organs have a firm contact and the muscular tension is observed during the articulation.

The km. tracings of [kacche](No. 57) [patte](No. 58)(Appendix) [jobbe](No. 26)(P241A) show that the closure is for a longer duration. These kms. can be compared with those of [kace](No. 34)(Appendix) [pate] (No. 7)(139A) and [jɔpe](No. 24)(241A). The period of closure for a simple consonant in the forms [kace], [pate], and [jɔpe] is shorter (13 c/s) than the corresponding closure for the consonant sequences in the forms [kacche], [patte] and [jobbe] (17, 20 & 16 c/s).

In the articulation of [-cch-] sequence in [kacche] the whole of the tongue is held tight against the roof of the mouth

and the tip of the tongue is down and when the air is released it comes out with affrication. The articulation is aspirated.

In the km. of [kacche](No.57)(Appendix), the larynx tracing does not show any wave form during the closure in the mouth tracing. There is an upward displacement in the wave form in the M tracing with the release.

See pm. of [kacche](No.66)(Appendix). The wipe off shows contact for the whole of zone 4 and part of zone 3.

For the articulation of [-tt-] sequence in [patte] the tip and blade of the tongue touch the teeth and the teeth-ridge. The articulation is unaspirated and voiceless throughout.

See km. of [patte](No.58)(Appendix)

The pm. of [patte](No.65)(Appendix) shows a wipe off extending from zone 1 well into zone 4. The wipe off of [pate] is not so broad and does not extend into zone 4 in the left and right zones.

In the articulation of the sequence [-bb-] in [jobbe] the lips are closed and held for a considerable period. Vocal cords vibrate all through.

See km. of [jobbe](No.26)(P24/A). The prominent wave forms are seen throughout the period of closure in the Larynx tracing.

Palatograms do not show any wipe off for the bilabial articulations.

In the articulation of [-ll-] sequence in [mille] the contact is maintained by the tip and blade of the tongue with the teeth ridge, the air is released on both sides of the tongue. The articulation is voiced all through.

The km. of [mille] shows in complete closure in the mouth

tracing. Prominent wave forms in the L tracing are seen all through. See km. of [cillae](No.37)(Appendix)

The pm. of [mille](No.63)(Appendix) shows a bow shaped wipe off from the middle of zone 2 to the beginning of zone 4.

For the articulation of bilabial homorganic sequence [-mb-] in the form [jombe] the lips are closed and held together for a longer duration than for a simple [-m-] or [-b-] in the forms [jome] and [jabe] respectively. The articulation as a whole is voiced. The soft palate is in its lowered position during the first part of the oral closure.

See km. of [jombe](No.72)(Appendix). This km. shows the greatest amplitude of wave forms in N tracing during the first part of the closure in the M tracing, and dying down gradually towards the last part of the closure.

In the articulation of [-nt-] in the form [mante] the tip and blade of the tongue are held against the teeth-ridge for a longer period than for a simple [-n-] or [-t-] in the forms [mane] and [mate] respectively.

The km. of the form [mante](No.73)(Appendix) shows features of prominent nasality during the first part of the oral closure in the M tracing and absence of nasality and voicing during the later part of the oral closure. This km. may be compared with those of [mane](No. ~~80~~ 78) and [mate](No. 74)(Appendix).

Pm. of the form [mante](No.67)(Appendix) shows wipe off from zone 1-3.

6.2.2.3.2 Heterorganic Stem-ending sequences

Heterorganic Consonant sequences in the junction of stem and ending of the monosyllabic stem patterns CVC- and VC are of the following phonetic patterns:

1. Plosive Plosive
2. Plosive Liquid
3. Liquid Plosive
4. Liquid Liquid
5. Sibilant Plosive
6. Sibilant Liquid
7. Nasal Plosive
8. Nasal Liquid.

They are listed below with examples.

	Voiceless throughout	Voiced voiceless	Voiced throughout	Voiceless voiced	
1. Plosive Plosive					
(i)velar Alveolo-palatal	[-kch-]	-	-	-	[pakche] [dekche] [jakche]
(ii)Velar - Dental	[-kt-]	-	-	-	[pakte] [dekte] [jakte]
(iii)Velar - Bilabial	-	-	[-gb-]	-	[pagbe] [degbe] [jagbe]
(iv)Alveolo-palatal - Dental	[-ct-]	-	-	-	[kacte] [macte] [bucte]
(v) "	[-cht-]				[mochte]
~~(vi)Alveolar Fricative - Dental~~	~~[-st-]~~				~~[kaste]~~ ~~[maste]~~ ~~[buste]~~ ~~[moste]~~
(vii)Alveolo-palatal - Bilabial			[-jb-]		[kajbe] [mojbe] [bujbe]

(viii)Retroflex Alveolo-palatal	[-ʈch-]			[kaʈche] [piʈche] [uʈche]
(ix)Retroflex Dental	[-ʈt-]			[kaʈte] [piʈte] [uʈte]
(x)Retroflex Bilabial			[-ɖb-]	[kaɖbe] [piɖbe] [uɖbe]
(xi)Retroflex flap-Alveolo palatal		[-ɽch-]		[poɽche] [baɽche] [uɽche]
(xii) Retroflex-flap-Dental		[-ɽt-]		[poɽte] [baɽte] [uɽte]
(xiii)Retroflex-flap Bilabial			[-ɽb-]	[poɽbe] [baɽbe] [uɽbe]
(xiv)Dental Alveolo palatal	[-tch-]			[patche] [motche] [gatche]
(xv) " "		[-dch-]		[ʃadche] [kãdche] [bãdche]

(xvi)Dental Bilabial			[-db-]		[padbe] [modbe] [gadbe]
(xvii)Bilabial Alveolo-palatal	[-pch-]				[jopche] [dupche] [nipche]
(xviii) Bilabial-Dental	[-pt-]				[jopte] [dupte] [nipte]
2. Plosive-Liquid					
(i)Velar Lateral				[-kl-]	[pakle] [dekle]
(ii)Velar fricative-Lateral				[-xl-]	[dexle] [raxle]
(iii)Velar-Lateral			[-gl-]		[jagle] [ragle]
(iv)Alveolo-palatal-Lateral				[-cl-]	[kacle] [rocle] [bãcle]
(v) " "				[-chl-]	[muchle] [gochle]

(vi) Alveolo-palatal Lateral			[-jl-]		[bajle] [majle]
(vii) " "			[-jhl-]		[bujhle]
(viii) Retroflex lateral				[-ʈl-]	[kaʈle] [piʈle] [uʈle]
(ix) Retroflex flap lateral			[-ɽl-]		[poɽle] [baɽle] [uɽle]
(x) Dental Lateral				[-tl-]	[patle] [motle]
(xi) " "			[-dl-]		[ʃadle] [kãdle]
(xii) Bilabial Lateral				[-pl-]	[jople] [maple]
(xiii) " "			[-bl-]		[ɖuble] [nible]

Liquid Plosive					
(i) Lateral-Alveolo-palatal		[-lch-]			[tulche] [khelche] [bolche]
(ii) "Dental		[-lt-]			[tulte] [khelte] [bolte]
(iii) " Bilabial			[-lb-]		[tulbe] [khelbe] [bolbe]
(iv) Tap Alveolo-palatal		[-rch-]			[korche] [parche]
(v) " Dental		[-rt-]			[korte] [parte]
(vi) "Bilabial			[-rb-]		[korbe] [parbe]
4. Liquid Liquid					
(i) Tap-Lateral			[-rl-]		[korle] [parle]
5. Sibilant Plosive					
(i) palato Alveolar-Alveolo-palatal	[-ʃch-]				[boʃche] [aʃche]

(ii)" Palato alveolar Dental	[-ʃt-]				[boʃte] [aʃte]
(iii)" Bialbial			[-ʒb-]		[boʒbe] [aʒbe]
(iv) Alveolar fricative Dental	[-st-]				[kaste] [maste] [bnste] [moste] } 1
6 Sibilant – Liquid					
alato-alveolar-Lateral				[-ʃl-]	[boʃle] [aʃle]
7. Nasal Plosive					
(i)Bilabial Alveolo-palatal		[-mch-]			[komche] [ghamche] [jomche]
(ii) "Dental		[-mt-]			[komte] [ghamte] [jomte]
(iii)Alveolar-Alveolo-palatal		[-nch-]			[janche] [manche] [anche]
(iv)Alveolar-Bilabial			[-nb-]		[janbe] [manbe] [anbe]
(v)Velar-Alveolo-palatal		[-ŋch-]			[bhaŋche] [maŋche]
(vi)Velar Dental		[-ŋt-]			[bhaŋte] [maŋte]
(vii)Velar Bilabial			[-ŋb-]		[bhaŋbe] [maŋbe]

1. They are alternative pronunciation of [kacte], [macte], [bncte] & [mocte] respectively.

8. Nasal Liquid					
(i) Bilabial Lateral			[-ml-]		[komle] [ghamle] [jomle]
(ii) Alvelar Lateral			[-nl-]		[janle] [manle] [anle]
(iii) Velar Lateral			[-ŋl-]		[bhaŋle] [maŋle]

It should be noted that the articulation with [-ch-]-ending is always characterized by breathy release. Where the initial component of the sequence is a fricative the articulation is characterized by slight aspiration. Articulations of all other sequences are characterized by absence of breathiness.

Where the second C element is a bilabial voiced plosive [-b-] the sequence as a whole is characterized by voicing and absence of aspiration. Where the second C element is a voiced alveolar lateral and the first C element is a voiced consonant, the articulation is voiced throughout, and where the first C element is voiceless the articulation is partly voiceless and partly voiced. Where the second C element is an alveolo-palatal voiceless aspirated plosive or dental voiceless unaspirated plosive and the first C element is one of

voiced [-ɽ-], [-d-], [-r-], [-l-], [-m-], [-n-], [-ŋ-], the articulation is voiced followed by voicelessness. Everywhere else, where the second C element is a dental voiceless unaspirated plosive the articulation as a whole is voiceless and the release is always unaspirated; and where the second C element is an alveolo-palatal voiceless aspirated plosive the articulation as a whole is voiceless and the release is always aspirated.[1]

See kms. of [degbe](No.32) [jagle](No.59) [pakle](No.60) [jopte](No.25)(241A).

The forms [korche], [korte] and [korle] have alternative realizations, respectively [kocche], [kotte] and [kolle] with some speakers. In the pronunciation of [korche], [korte] and [korle] two distinctly consonantal realizations are observed. In the alternative pronunciation, on the other hand, the tongue is not released after the first consonant of the sequence but is held tight for a considerable period of duration and the articulation is geminated. Thus we have [kocche], [kotte] and [kolle].

Pms. of the forms [korche](No.68) [korte](No.69) and [korle](No.70)(Appendix), may be compared with those of [kocche](No.71) [kotte](No.72) and [kolle](No.73)(Appendix).

Kms. of [korche](No.63) and [korte](No.61)(Appendix), may be compared with those of [kocche](No.64) and [kotte](No.62)(Appendix). They show different pictures.

The forms [kacte], [bãcte] and [bucte] also have alternative pronunciations as [kaste], [bãste] and [buste]. In the articulation of [-ct-] sequence in the forms [kacte], [bãcte] and [bucte], there is a release of air after [-c-] when the tongue moves from the alveolar region to further forward and the tip is raised to touch the upper teeth. This release can be termed an anaptyctic vowel.(ə) .

See km. of [kacte](No.65)(Appendix)

In the articulation of the alternative form [kaste] the tip of the tongue is raised against the alveolar region and the air is released with friction. The articulation observed is a voiceless alveolar fricative. The tip of the tongue moves forwaıd after that for the dental contact. The articulation of the sequence as a whole [-st-] is a tip up articulation, whereas in the case of [-ct-] in [kacte] the tip of the tongue is down during the first part of the closure, and it moves towards dental region giving rise to an anaphyctic vowel (ə).

pms. of [kacte](No.74) and [kaste](No.75)(Appendix) may be compared.

Heterorganic stem-ending sequences involving a nasal consonant are of only one type, e.g. -NC-. It is never a -CN- or an -NN-. The first element can be any of the three nasal consonants, bilabial [-m-], alveolar [-n-] and velar [-ŋ-], the second element being any one of [-ch-], [-t-], [-b-] and [-l-].

In -NC- sequences where the final element is a voiced

bilabial plosive [-b-] or a voiced alveolar lateral [-l-], the sequence as a whole is voiced. Where the final element is a voiceless dental plosive [-t-], or a voiceless alveolo-palatal plosive [-ch-] the articulation of the sequence is partly voiced and partly voiceless. With [-ch-] as the -C- element the release of the sequence is aspirated, elsewhere it is unaspirated. Nasality is not observed during the whole period of closure. The soft palate is raised during the later part of the oral closure.

In the pm. of the form [kaṯle] [-t͡l-] sequence gives a wider wipe off covering an area from the first molar line extending as far as lateral incisor line. The form as a whole is characterized by retroflexion. See pm. of [kaṯle](No.76)(Appendix) Compare this with pm. (No.57) of [paḷṯe](Appendix) in which the wipe off covers zone 4 only.

See kms. of [jombe](No.72) and [mante](No.73)(Appendix)

Pms. of the form [mante](No.67)(Appendix) shows wipe off covering an area from zone 1 to a part of zone 4.

Pm. of the form [manle](No.55)(Appendix) gives a different wipe off in the artificial palate. The wipe off covers part of zone 4 and 3 and extends no further.

Pm. of the form [manbe](No.58)(Appendix) shows a wipe off extending upto the lateral incisor line.

In the articulation of [bhaŋche] there is movement of the body of the tongue from a velar articulation extending as far forward as zone 7 to a Palatal articulation in leaving an area in zones 5, 6 and 7 unwiped. See pm. of [bhaŋche](No.44)(Appendix

In -SP- sequences, where the -P- element is a voiced bilabial plosive [-b-], the sequence as a whole is voiced.

See km. of [boʒbe](No.51)(Appendix). Pm. of [boʒbe] shows palate alveolar contact. With [-ch-], [-t-] and [-l-] as second element the sibilant is a voiceless fricative.

See km. of [boʃte](No.52)(Appendix)

See pms. of [boʃche](No.77) [boʃte](No.78) and [boʃle] (No.79)(Appendix)

6.2.2.4 Geminated clusters in the stem and ending junction.

There is a long consonantal articulation in the junction of the forms where the morphological stem syllable is open and the ending initial is the voiceless alveolo-palatal aspirated plosive [-ch-]. Thus, in the pronunciation of the forms [kacche] and [khacche] phonetically [-cche] is identical. But the structures of the two forms are different. The generalized structures of the forms whose morphological division is shown by a hyphen, are CVC-CV and CV-^{g}CV respectively. This characteristic feature of the second form (i.e. [khacche]), which I call geminated junction, is marked with a raised g over the initial -C- of the ending structure. e.g. [khacche] phonologically represented as CV-^{g}CV.

This feature of geminated junction is observed where the ending begins with an alveolo-palatal plosive [-ch-] in those grammatical forms of some CV- stem verbs as well as in all the polysyllabic (extended and non-extended dissyllabic and

reduplicated trisyllabic) stem-patterns whether or not the stem pattern has already a consonant cluster (as in (C)VCCə- stem patterns) or a consonant sequence (as in the reduplicated stem pattern CVC/CVCə-).

Some examples are given with their phonological structures.

[khacche]	CV-^{g}CV
[kaʈacche]	CVCə-^{g}CV
[uʈhacche]	VCə-^{g}CV
[khawacche]	CVə-^{g}CV
[kamʈacche]	CV$\widehat{\text{CC}}$ə-^{g}CV
[ulʈacche]	V$\widehat{\text{CC}}$ə-^{g}CV
[piʈpiʈacche]	CVC/CVCə-^{g}CV

These geminated forms may be compared with the non-geminated forms with ending initiated by a voiced bilabial plosive [-b-]. Thus,

[khabe]	CV-CV
[kaʈabe]	CVCə-CV
[uʈhabe]	VCə-CV
[khawabe]	CVə-CV
[kamʈabe]	CV$\widehat{\text{CC}}$ə-CV
[ulʈabe]	V$\widehat{\text{CC}}$ə-CV
[piʈpiʈabe]	CVC/CVCə-CV

In the articulation of [-cch-] in the form [khacche] the tongue is held for a period of longer duration than for [-ch-] in [ache].

Kms. of [khacche](No.30) and [khete](No.29) (P 243A) may be compared. In the km. of [khacche] the period of closure shows 16 c/s., and the corresponding period of closure in the km. of [khete] shows 12 c/s.

Pms. of [khacche] shows similar wipe off as [kacche]. see pm. [kacche](No.66)(Appendix)

73 At the phonological level economy can be achieved by following certain means of abstraction.

Whenever two C elements are stated adjacently within a verbal form, they are either

(i) marked with a bracket over them in the generalized structure as -C͡C- with the implication that the consonants are within the morphological abstraction of a dissyllabic stem (C)VC͡Ce-; or

(ii) marked with an oblique bar between them in the generalized structure as -C/C- the implication of which is that the two consonants are within the morphological abstraction of a reduplicated stem pattern CVC∅/CVCe-; or

(iii) they are marked with a hyphen in between them in the generalized structure as -C-C- with the implication that the two Cs belong to the two different morphological entities, stem and ending, that is to say, they occur at the junction of morphological abstractions stem and ending; or

(iv) marked with a small raised g over the right hand side of the hyphen which marks the stem-ending division in the generalized structure as -^{g}C- with the implication that the linking feature of stem and ending in the forms whose stem syllable is open and ending syllable is initiated by [-ch-] is geminated.

PART THREE

THE PHONOLOGY

CHAPTER 7 ELEMENTS OF THE PHONOLOGICAL ANALYSIS.

CHAPTER 8 ENDING STRUCTURES.

CHAPTER 9 STEM STRUCTURES : THE V AND ə ELEMENTS. OF STRUCTURES.

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CHAPTER 7

The Elements of Phonological Analysis.

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CHAPTER 7

The elements of the phonological analysis.

7.0 The phonological analysis is stated by means of certain elements which are set up for this purpose. These elements are word, syllable, phonematic units and prosodic features. All these elements are elements of the phonological analysis and must not be confused with elements established at another level of statement, e.g. phonetic or grammatical level, though the phonological elements may correspond to some elements established at other levels.

The word has status primarily as a unit of grammatical structure. And the verb as a word class category is delimited and defined through such syntactical criteria as place and order in the sentence, through colligational relations of agreement, and concord of ~~tense~~, person and grade with the nominal, and where the verbal piece contains more than one unit through the relations between the units of the verbal piece in those syntactical constructions. However, since every word is characterized by phonological and phonetic features, the verb form, though primarily a grammatical element, is also recognized as having phonological status as an element in the phonological analysis. The structure of the form is described in terms of syllables and prosodic features.

The syllable has status at both phonological and phonetic levels. The phonetic syllable and the phonological

syllable do not always correspond exactly. The structure of the phonological syllable is stated in terms of phonematic units and prosodic features.

Phonematic units are phonological elements having phonetic exponents which may be referred to a given place in the syllable. Phonematic units are of two kinds. Consonantal units and vocalic units, which will be referred to as C and V units. There is, in addition, a phonological syllabic unit ə which may be referred to as ə schwa unit throughout this analysis.[1]

Prosodic features[2] are phonological elements having phonetic exponents which either extend over more than one place in the structure or have implications over more than one place in the structure in that they delimit a structure from preceding and following structures. Prosodic features may be stated for a word as a whole or some part or parts of a word, for a syllable as a whole or some part or parts of a syllable.

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1. Phonematic units can not be identified with the usual 'phonemes' set up to handle the phonological analysis of other kind. (See W.S.Allen, B.S.O.A.S. Vol.16, 1954,p.556), nor are prosodic features to be equated with the supra-segmental phonemes of 'phonemic phonological analysis'. There will be, of course, some similarity between the phonetic exponents of these two pairs of phonological categories, but since the systems of which they are members are different any attempt to make one to one identifications is bound to be misleading.
2. See J.R.Firth, 'Sounds and Prosodies', T.P.S. 1948, p.127-52. and also R.H.Robins, 'Aspects of Prosodic Analysis', Proc. Univ. Durham, philo-society. Vol.I, Series B.

7.1 The Syllable Structure

The structure of the syllable will be described in terms of systems appropriate to the phonematic units and in terms of systems appropriate to the prosodic features, and in terms of two places, initial and final. Different statements are made for the systems, whether prosodic or phonematic, which are stated for these places.[1]

Every syllable has a nucleus which consists of a V i.e. the syllable nucleus is always characterized by a vocalic articulation.[2] At the phonological level of abstraction the syllable nucleus is stated either as V, a term in a vowel system, or as ə a term in a syllabic system. The generalized structures in colloquial Bengali verbal form are eight in number. A syllable may comprise this nucleus alone or a nucleus that is preceded and/or followed by a C unit. The eight types of syllables found are: V, CV, ə, Cə, VC, əC, CVC and CəC.

Thus it will be seen that every syllable has a V or ə unit but not every syllable has a C unit.

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1. This is in marked contrast with a 'phonemic' phonological analyses in which one overall system is set up. For example, in such an analysis two phones not in complementary distribution at one point in the structures are assigned to two different phonemes and this distribution is maintained even at those points in the structure where no contrasts exhists and the two phones are in complementary distribution. The treatment adopted in this thesis, however, would set up different systems for the two places of the structures. It is polysystemic, whereas the phonemic treatment is monosystemic.
2. In my dialect, however, syllabic consonantal articulation is also found.

So far as the verbal piece is concerned, ə and Cə are restricted to the final syllable of the dissyllabic (extended and non-extended), and trisyllabic stem and əC to the first syllable of the ending. The rest have no such restrictions. ə can not be an element of structure in the first syllable of the verbal form.

7.1.1 Syllable Division

Initial C- belongs to the same syllable whose nucleus is the following -V or -ə. The final -C belongs to the same syllable whose nucleus is the preceding V- or ə-. Every intermediate single C belongs to the same syllable with the following -V or -ə. Where two adjacent -CC- elements are stated, the first C belongs to the syllable whose nucleus is the preceding V- or ə-, and the second to the syllable whose nucleus is the following -V or -ə. This point is illustrated in the following examples.

[ulʈabe]	VC	Cə	CV
[khawabe]	CV	ə	CV
[kamɽae]	CVC	Cə	V
[kaʈiʃ]	CV	CəC	

Where two V elements or ə and V or V and ə or two ə elements are stated adjacently in any generalized structure, such abstraction represent two syllables in each case.[1] e.g.

[khae]	CV | V
[kaʈae]	CV | Cə | V
[khaʃ]	CV | əC
[kaʈaʃ]	CV | Cə | əC

It will be seen that the phonological syllable division cuts across the morphological abstraction made as stem and ending. Thus, in the generalized structure CVCV of the form [kaʈe] 'he cuts' the morphological division of stem and ending is CVC-V, but phonologically syllables are divided as CV | CV.

7.2 V, ə and C elements of structure.

7.2.0 A generalized statement of the maximum number of V and C units set up in this thesis will be made here. A detailed statement of V and C systems required to be stated where V, ə and C are elements of structure will be made in the following chapters in which each stem or ending structures will be handled separately.[2]

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1. Their phonetic exponents may sometimes be a single vowel or a diphthongal articulation. e.g. [kaʈaʃ] CVCə-əC. See § 8 and also §10.4 for phonetic exponents of the forms in endings [-iʃ] [-uk] etc.
2. This has been studied from a multi-structural point of view. cf. In his theory J.R.Firth considers language from a multi structural stand point when he talks of 'structures' in the plural. See for instance, 'Structural Linguistics', T.P.S., 1956, pp. 89 ff.

Prosodic and syllabic systems will also be generalized in this chapter. The detailed prosodic features of the stem and endings require separate treatment in particular chapters concerned, rather than in this generalized statement.

7.2.1 V Units

Three V units representing three grades of openness are stated in the present thesis. They are:

ɪ the close unit,

ɛ the mid unit, and

ɑ the open unit.

In reading the phonological formulae these three symbols maybe read as the Iota, the Epsilon, and the Alpha unit respectively.

The phonetic qualities, such as, frontness and backness, liprounding and unrounding, are stated as exponents of syllable prosodies and not as characteristics of the vocalic articulation alone. Being stated prosodically for the syllable as a whole these qualities are equally characteristics of the consonantal articulations as well.

V systems are set up for the first syllable of the stem and for all the syllables of the endings, except where the initial element of the ending structure is e-.

The vocalic qualities observed in syllables for which ɪ is stated as an element of structure include closeness.

Examples: C,C : [piʈi] 'I beat',

[tuli] 'I raise'.

The vocalic qualities in syllables for which ∈ is stated as an element of structure include from half-closeness to half- openness.

Examples:

C ∈ C- [peʈa] 'to beat'

[tola] 'to raise'.

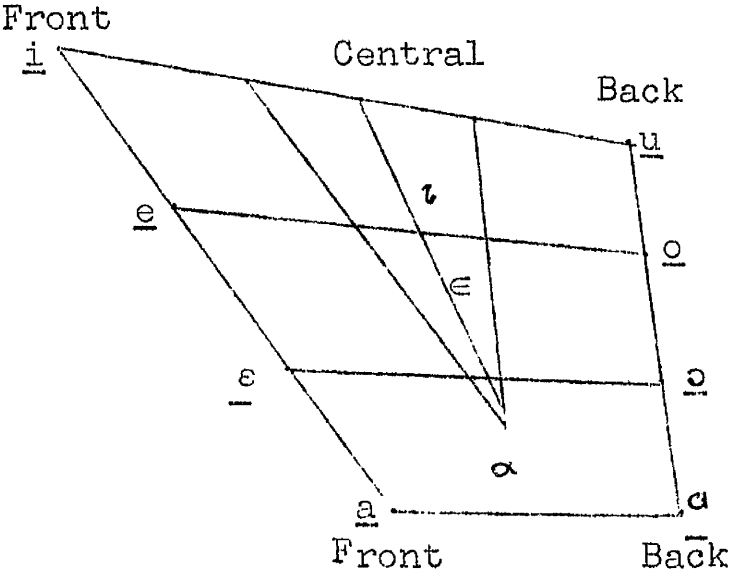
The vocalic qualities in syllables for which α is stated as an element of structure include from half-openness to openness.

Examples: C α C- [dækha] 'to see'

[bɔla] 'to say'

[kaʈa] 'to cut'.

The vocalic qualities observed in syllables for which ɪ, ∈ or α is stated as an element of structure can be shown on a vowel diagram with reference to Cardinal vowel qualities.



The vocalic qualities in syllables of which ɪ, ɛ or ɑ is an element of structure can be plotted in range ɪ, ɛ and ɑ respectively.

One syllabic unit ə is stated for the second syllable of the dissyllabic stem and also for the initial syllable of the ending. Unlike V, ə does not belong to the system of commutable terms for the vowels, and as such has a different linguistic value. The vocalic qualities in syllables for which ə is stated as an element of structure include closeness, half-closeness, half-openness or openness. These qualities may be stated in terms of the place of the syllable in the form. And therefore, it is convenient to refer to ə as syllabic.

Examples: CVC-əC [kaʈiʃ], [kaʈun], [kaʈuk], [kaʈen]. [kaʈon].

CVCə-V [kaʈai].

CVCə-CV [kaʈabe], [kaʈate].

CVCə-əCV [kaʈieche].

A word has to be said about the syllabic ə. Schwa has been treated at two different levels - phonological and grammatical - in two different meanings. It has distinctly different functions and status at different levels. The use of this therefore must not be confused.

At the grammatical level ə is part of a morphological structure stem or ending. It occurs at the stem final syllable in the dissyllabic and trisyllabic stem, and ending initial in

the monosyllabic, dissyllabic and trisyllabic ending, and has a grammatical status at that level. The implication of ə at the grammatical level is that the structure belongs to a particular category. A monosyllabic stem is always found without a ə. ə occurs only in a dissyllabic (extended and non-extended) and a trisyllabic (reduplicated) stem. That is to say, so far as the morphological stem abstraction is concerned ə never occurs in the stem of a non-causative verbal form, whereas it always occurs in the stem of a causative verbal form. This is one of the formal criteria by which distinction could be made between an active and a causative verbal form.

At the phonological level schwa in the stem structure stands for syllabic articulation, the phonetic realization of which is restricted to (i) an open vowel, halfway between front and back, without lip-rounding, or (ii) close front without lip-rounding according to the environment and relation of the following V or ə element of structure. This is shown in the chapter dealing with vowel harmony.[1] Its restriction to the dissyllabic stem pattern and trisyllabic stem pattern of the reduplicated form is also of phonological relevance.

Similarly, ə in the ending structure also has two meanings at the two different levels. At the grammatical level ə occurs in the ending initial position and never any other position. It occurs in the monosyllabic structure -əC which is the only monosyllabic structure constituted of two elements ə and C in that order; all the other monosyllabic ending structures

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1. See Chapter 10.

are either open, as -V, -CV, or closed as -CVC or -VC. It also occurs in the initial position of dissyllabic and trisyllabic ending structures whose initial element is not a C. It as such a determinator of the morphological ending abstraction at that level. The phonetic expression of ə in the ending structure has five alternatives: (i) front unrounded close vowel [i], (ii) front unrounded half-close vowel [e][1], (iii) back rounded close vowel [u], (iv) back rounded half-close vowel [o], or (v) nil. In ending structure ə has no phonetic expression of a neutral open vowel [a]. And as such it has a different linguistic value than V as a system at the phonological level.

Since the phonetic exponent of ə is open neutral, close front, close back, half-close front, half-close back vowel or nil according to the vocalic articulation of the following syllable, and according to its place in the structure of the form, it is convenient to refer to ə as a syllabic. The relation between the open neutral vowel and close front or half-close front, or close back or half close back vowel or nil is treated in terms of the alternative phonetic exponents of a single phonological category. The exponent of ə is stated in relation to the place of the syllable in the word. The features of openness or closeness, frontness or backness have been treated prosodically, and are clearly brought out in the phonological section.

1. In my speech some forms with [-ɛnɔ] ending have two alternative pronunciations which may be transcribed as [-ɛnɔ] and [-ɛnɔ], e.g. [ɛdɛ khɛnɔ] and [ɛdɛ khɛnɔ]. For pronunciation of other forms

7.2.3 C Units

Four C sub systems are stated in this thesis. They are

1. Plosive,
2. Liquid,
3. Sibilant, and
4. Nasal.

In order to state the phonological implications of these terms it is necessary to refer to some of the prosodic features characterizing the syllables in which the terms in these sub-systems are elements of structure.[1] The prosodic features referred to here will be discussed in details in the following section.[2]

1. Plosive Sub-system.

~~Three~~ Four terms b , d, j and g are stated for the plosiv sub-system. Each is a C element of structure in syllables characterized by h or $\overline{h}_{m}$ and v or $\overline{v}_{m}$ prosody.[3] Of these terms b is the bilabial unit, d is the apical unit, and g is the dorsal unit.

Examples:

Bilabial b unit [peɫe] 'he beats'

[bɔle] 'he says'

---

1. For structure and system See J.R.Firth, 'A synopsis of Linguistic Theory, 1930-1955', p.17ff. See also 'Sounds and Prosodies' in Papers in Linguistics 1934-1951, pp.121-138.
2. Infra. § 7. 3.
3. See for phonetic implication of h and $\overline{h}$, v and $\overline{v}$ and r and r Prosodies, § 7.3.2-4 (infra)

[phaṭe] 'it breaks!

[bhoge] 'he suffers!

Apical d unit [tole] 'he raise!

[dhekhe] 'he sees!

[thake] 'he stays!

[dhore] 'he catches!

Dorsal g unit [kaṭe] 'he cuts!

[gabe] 'he will sing!

[khaṭe] 'he works!

[ghame] 'he sweats!.

Dorsal j unit [ɑapeɔ] 'he presses'.
[chapeɔ] 'he prints'.
[ɟəpeɔ] 'he counts (the beads)'.

2. Liquid Sub-system

Two terms l and r constitute the Liquid sub-System. Each is a C element of structure in $\bar{h}$ [1] and v syllables. Of these two terms l is the lateral unit and r is the tap unit. Both l and r are apical units.

Lateral unit l - [lekhe] 'he writes'.

Tap unit r - [rakhe] 'he keeps'.

3. Sibilant sub-system

s constitute the sibilant sub-system. It is a C element of structure in syllables characterized by $\bar{h}$ and v or $\bar{v}$ prosodies.

s is an apical unit.

Example : Apical unit s [ʃekhe] 'he learns'.

---

1. h/$\bar{h}$ prosodics are not the only prosodies characterizing C-initial syllables. But it is convenient to distinguish between the four sub-systemsin this way with reference to the h/ $\bar{h}$ prosodies on the one hand and number of terms stated for each sub-system on the other.

4. Nasal Sub-system

Three terms m, n, ŋ constitute the nasal sub-system. Each is a C element of structure in $\bar{h}$ and v syllables. m and n are elements of structure in the syllable in all positions, whereas ŋ is restricted in so far as it is not found in word initial position. Of these three terms constituting th nasal sub-system, m is the bilabial unit, n is the apical unit and ŋ is the dorsal unit.

Examples:

Bilabial unit	m	[mare]	'he kills'
Apical "	n	[nace]	'he dances'
Dorsal "	ŋ	[bhaŋe]	'he breaks'

Labial, Apical, Dorsal, Plosive, Liquid, Sibilant and Nasal - are all phonological terms.[1]

In making the above phonological statement of C - sub-system and the terms in this sub-system, such phonetic characteristics as breathiness and absence of breathiness, voicing and absence of voicing, retroflexion and absence of retroflexion etc. which are traditionally attributed to the consonants, are abstracted and stated in terms of prosodies characterizing the syllable or a group of syllables.

7.3 Prosodic elements of Structure.

7.3.0 In order to focus attention on the phonological features the following prosodies will be stated.

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1. See Chapter 6

(i) Prosodies of the syllable as a whole:

y, w, and ɔ

(ii) Prosodies of the syllable initial or final:

v̈,/ non-v̈; h / non - h, r / non -r and

n / non-n.

(iii) Prosodies of junction:

y, w and absence of these; and g and non-g.

y- Prosody has the phonetic implication of frontness and absence of liprounding in articulation.

w- Prosody has the phonetic implication of backness and presence of liprounding in articulation.

ɔ - Prosody has the phonetic implication of openness and absence of liprounding, neither front nor back in articulation.

v- Prosody has the phonetic implication of voicing in articulation.

Non-v - Prosody has the phonetic implication of absence of voicing in articulation.

h- Prosody has the phonetic implication of breathiness in articulation.

Non- h- Prosody has the phonetic implication of absence of breathiness in articulation.

r- Prosody has the phonetic implication of retro - felxion in articulation.

Non-r- Prosody has the phonetic implication of absence of retroflexion in articulation.

n- Prosody has the phonetic implication of nasality in articulation.

Non-n- Prosody has the phonetic implication of absence of nasality in articulation.

g- Prosody has the phonetic implication of gemination in articulation.

non-g- Prosody has the phonetic implication of absence of gemination in articulation.

For notational clarity and typographical economy non-v, non-h, non-r, non-n and non-g prosodies will be denoted by leaving them unmarked. When, however, it is necessary to show contrast they will be denoted with a bar over them.

All the prosodies stated for syllable as a whole, syllable initial, syllable final or junction will be denoted by superscript y/w/ɔ, v/$\bar{v}$, h/ $\bar{h}$, n/$\bar{n}$ and r/ $\bar{r}$, over the syllable where they are stated as an element of structure. y, w or g prosody stated for junction is denoted by superscript y, w, or g over the junction where it is stated as an element of structure.

The following examples will illustrate this.

y:	^{y}CV ^{y}CV	[keṭe]	'having cut'
w:	^{w}CV ^{y}CV	[kuṭe]	'having cut'
ɔ:	^{ɔ}CV ^{y}CV	[kaṭe]	'he cuts'
v:	^{v}CV ^{y}CV	[baṭe]	'he distributes'
h:	^{h}CV ^{y}CV	[khaṭe]	'he works'
r:	^{r}CV ^{y}CV	[ṭane]	'he pulls'
n:	^{n}CV ^{y} CV	[nace]	'he dances'

	g:	CV ^{gy}CV	[pacche]	'he is getting!
Junctional	y:	CV ^{y}CV	[naiche]	'he is bathing!
"	w:	CV ^{w}V	[nawa]	'to have a bath!

More than one prosodic feature stated for a syllable or any part of it will be denoted by superscript notation side by side, except where n prosody is stated as an element of structure. n prosody is always accompanied by v prosody and never by $\bar{v}$ prosody. For notational economy, therefore nv prosodies will always be denoted by a superscript n and leaving v unmarked. Elsewhere the double or treble prosodies will be marked.

Examples:

$^{vh\circ}$CV ^{y}CV	[bhabe]	'he thinks!
$^{v\bar{h}r\circ}$ CV ^{y}CV	[ɖake]	'he calls!
$^{\bar{v}hry}$CV ^{y}CV	[ʈʰeke]	'he is held up!
^{vhrw}CV ^{y}CV	[ɖhuke]	'he enters!
$^{vn\circ}$CV ^{y}CV	[nace]	'he dances!

The phonetic significance of these prosodic characteristics will now be discussed in detail.

7.3.1 y, w, ∘ - Prosodies.

It has been observed that the syllable is characterized by (i) frontness and absence of lip rounding, (ii) backness and presence of liprounding or (iii) openness and absence of liprounding, frontness and backness.[1] These three features I

1. These features of frontness and backness etc. are not only characteristic of the vowels, but also of the consonants.

propose to call y-, w-, and ɒ prosodies respectively.

Of these phonetic criteria, liprounding and absence of liprounding are observed at the level of perception. In order to illustrate further the criteria of frontness, backness and openness in quality I cite some palatographic evidences and discuss the relevant feature in them. Observations of these phonetic qualities can be made through pms. which show certain characteristic correlations with the stating of y- prosody on the one hand and non-y (i.e. w or ɒ) prosody on the other, or w- prosody on the one hand and non-^{w} (i.e. y or ɒ) prosody on the other. This will be illustrated with reference to the following pms.

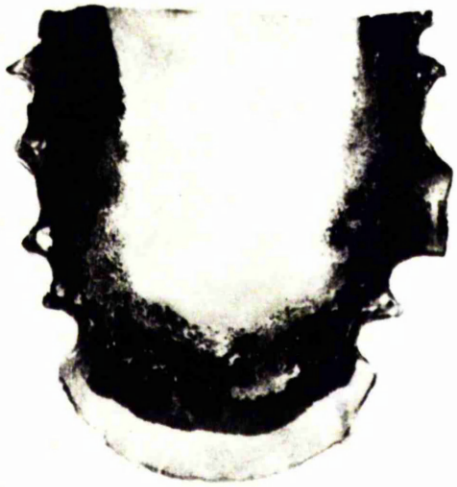
pms.	No.39.	[nibi]	^{y}CVCV
pm.	No.36	[nabe]	^{ɒ}CVCV
pm.	No.81	[nobo]	^{w}CVCV

The stem syllable in all three forms involves an apical articulation. In [nibi] it is y prosodic, in [nobo] w prosodic and in [nabe] ɒ prosodic.

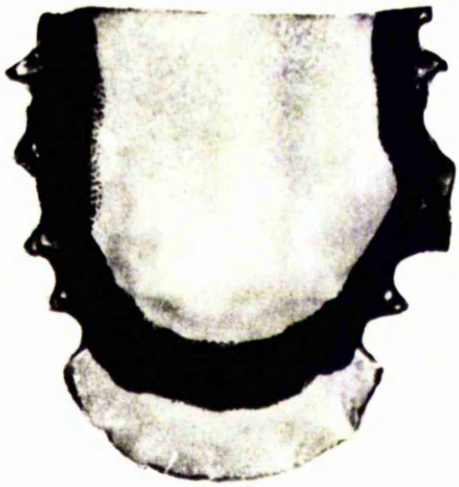
The pm. of [nibi] shows a wipe off covering a part of zone 4 and the whole of zone 3. The wipe off reaches as far forward as lateral incisor line. In pm. of [nabe] the wipe off covers a part of zone 4 and a part of zone 3. The pm. of [nobo] shows a wipe off covering mainly zone 4 and extends a little further forward than canine line.

pm. 39 indicates that during the pronunciation of [nibi] the apical contact between the tip and blade of the

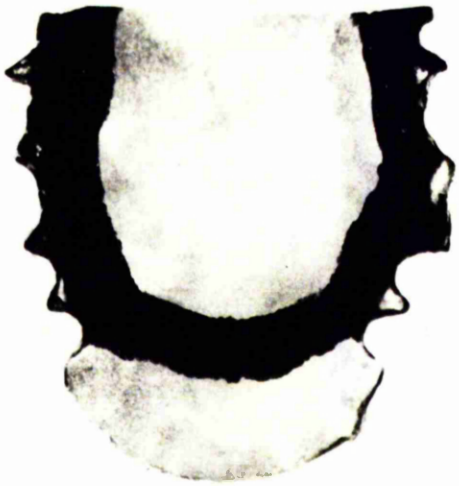
39. [nibi]



36. [nabe]



81. [nobo]



tongue and the artificial palate reached as far forward as the lateral incisor line. This correlate with the stating of y prosody as an element of structure for the stem syllable in [nibi].

Pm. 36 indicates that during the pronunciation of [nabe] the apical contact between the tip and blade of the tongue and the artificial palate reached as far forward as middle of zone 3, and no further. This correlate with the stating of $^{\circ}$ prosody as an element of structure for the stem syllable in [nabe].

Pm. 81 indicates that the contact of the tip and blade of the tongue reaches a little further forward than the canine line but does not extend so far forward as the middle of zone 3. This correlate with the stating of ^{w} prosody as an element of structure for the stem syllable in [nobo].

The vocalic qualities observed in syllables characterized by y, w and $^{\circ}$ prosodies may be shown thus:

	^{y}CVC-	$^{\circ}$CVC-	^{w}CVC-	^{y}CV̲C-	$^{\circ}$CVC-	^{w}CV̲C-
Close	[i]		[u]	[piʈ]		[kuʈ]
Mid	[e]		[o]	[peʈ]		[koʈ]
Open	[æ]		[ɔ]	[dækh]		[bɔl]
		[a]			[kaʈ]	

7.3.2 v and $\bar{v}$ prosodies.

These prosodies are stated for all syllables.

Where $\bar{v}$ is stated as an element of structure, the consonantal articulation of the syllable for which it is

stated are characterized by voicing. Where $\bar{v}$ is stated as an element of structure the articulations are voiceless.

These phonetic criteria characterizing the syllables for which v and $\bar{v}$ prosodies are stated, will be illustrated with reference to the following kms.

Km. ~~31~~ 24 [jɔpe]

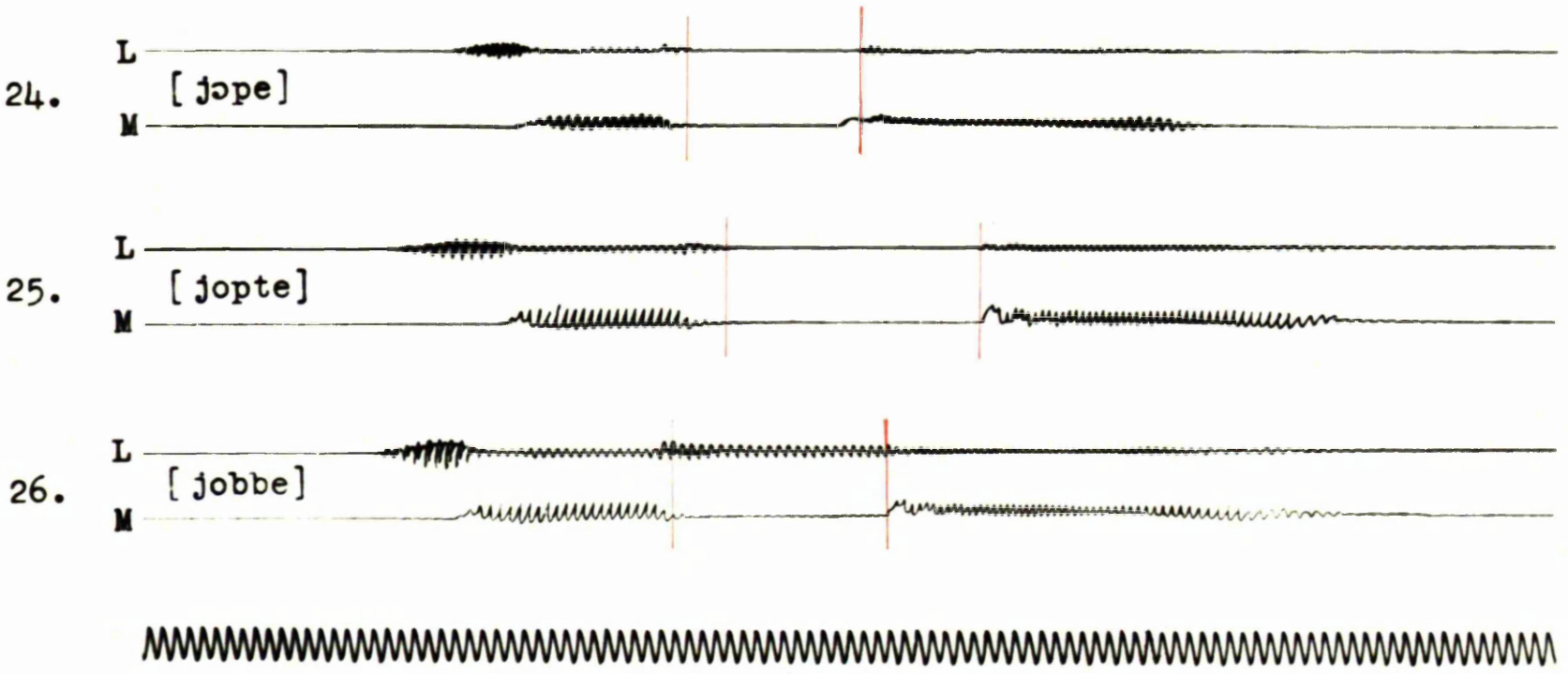
Km. ~~32~~ 25 [jopte] Km. ~~33~~ 26. [jobbe].

These kms. provide simultaneous mouth (M) and Larynx (L tracings.

It will be seen that there are prominent wave forms in the L tracing of the word [jobbe] parallel to the closure in the M tracing. In the L tracings of the words [jope] and [jɔpte] there are no prominent wave forms parallel to the closure phase. The wave forms in the L tracings of km. of [jobbe], parallel with the closure in M tracing correspond to the vibration of the vocal cords during the closure for the stop articulations of syllable 2 of these forms.

The absence of prominent wave forms in the L tracings of the forms [jɔpe] and [jopte] during the closure in the M tracings corresponds to the absence of vibration of the vocal cords during the stop phase of the consonantal articulations of syllable 2.

For this feature of voicing as in [jobbe], v prosody is stated as an element of structure for syllable 2. For the feature of absence of voicing in [jɔpe] and [jopte] $\bar{v}$ prosody is stated as an element of structure for syllable 2.


24.
L
[jɔpe]
M
25.
L
[jopte]
M
26.
L
[jobbe]
M

Both v - and $\bar{v}$ - prosodic syllables are ^{h} or $^{\bar{h}}$ prosodic.[1]

These prosodies are stated for both stem syllable initial and final and also for ending syllables. The Consonantal articulation of the syllable for which v or $\bar{v}$ is stated as a prosody, is characterized by voicing or absence of voicing in articulation.

Where v is stated as an element of structure in the ending syllable initial the consonantal complex as a whole is characterized by voicing.[2] This justifies for $_{v}$ or $\bar{v}$ as an abstraction.

Thus, C $V^{\bar{v}}$C - [kaṭe]

C V^{v}C - [kaḍbe]

The complex is characterized by $^{h/\bar{h}}$ prosody as well.

e.g. V $^{\bar{v}h}$C - [uṭhe] 'he gets up'

V $^{v\bar{h}}$C - [uḍbe] 'he will get up'.

7.3.3 h and $\bar{h}$ prosodies.

Where h is stated as an element of structure, the articulation of the syllable for which it is stated, is characterized by breathiness. Where $\bar{h}$ is stated as an element of structure the articulation of the syllable for which it is stated, is characterized by absence of breathiness.

---

1. Infra. See § 7.3.3.
2. These characteristics are dealt with in detail in Chapter 11

The phonetic criteria characterizing the syllables for which h and $\bar{h}$ prosodies are stated, will be discussed with reference to the following kms.

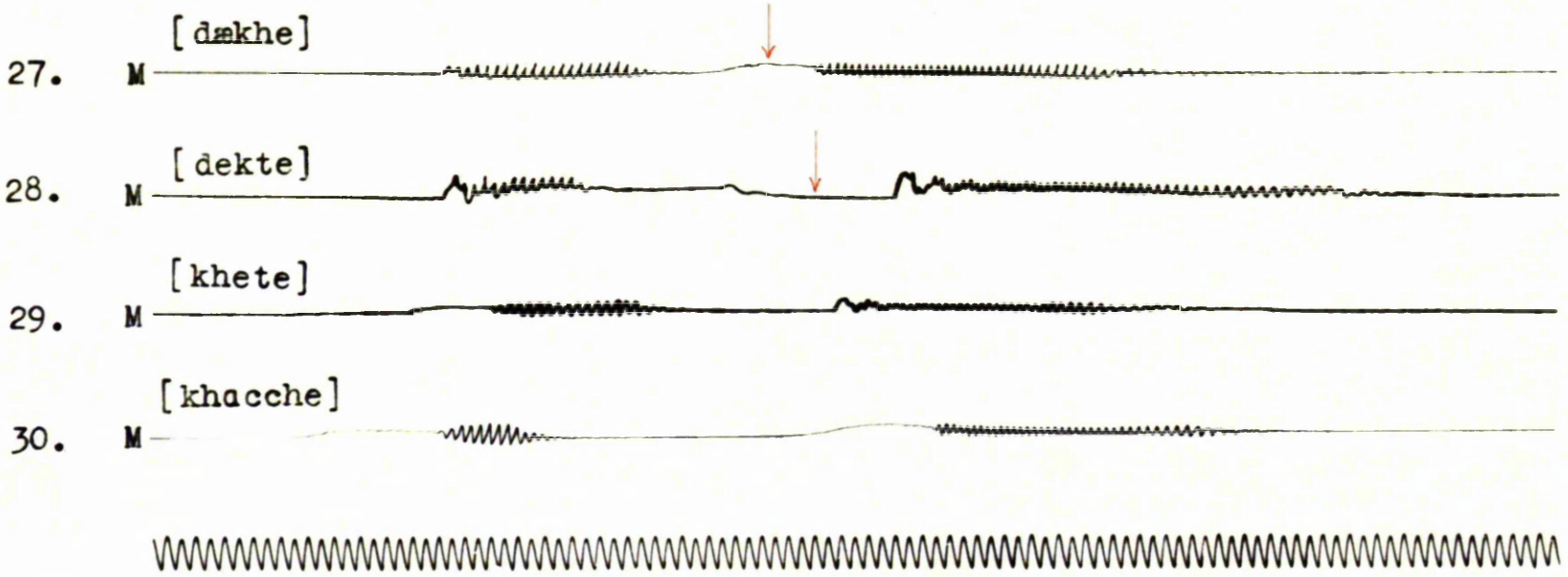
Km. No. 27 [dækhe]

km. No. 28 [dekte]

These Kymograms provide Mouth tracings. In the km. No. 27 there is an upward displacement at the beginning of the second group of prominent wave forms which correspond to the vocalic articulation of the second syllable. This upward displacement correspondsto the increased breathforce in the second syllable of the form [dækhe] and correlates with the stating of ^{h} prosody as an element of structure of the second syllable of the form.

No upward displacements are observed in the M tracings of the kms. of the word [dekte] at the beginning of the second set of prominent wave forms, which correspond to the absence of aspiration in the articulation of the forms. This feature of absence of breathiness in articulation correlates with the setting up of $^{\bar{h}}$ prosody as an element of structure of the second syllable.

The glottal fricative [h] is not generalized in terms of a C element of structure. Aspiration is stated as a prosody of the syllable as a whole.


[dækhe]
27.
M
[dekte]
28.
M
[khete]
29.
M
[khacche]
30.
M

8 Aspirate [h] is considered as just a manner of initiating or terminating a vowel, e.g. [hɔe],[1] where [h] has no distinctive function but only serves to add a stress breath glide while the vocal cords are being drawn near together for the following vowel. In such cases the onset of the breath flow and the on set of the glottal vibration are consecutive.

For phonological purposes therefore, it is not treated as a separate phonematic element. The aspiration and non-aspiration are a property of the syllable as a whole and not of a consonant or vowel as such.

The glottal fricative [h] differs from the consonants generalized in terms of C as follows:

1. [h] has a more limited distribution than the consonants generalized in terms of C. For instance, (i) [h] occurs only initially, and never occurs intervocalically nor finally in a verbal form.[2] (ii) h system in VC- stem structure excludes close front and back vowels.

Examples.

[hæle]	[hɔte]	[hate]
	[hɔe]	[haʃe]
		[hane]
		[hare]
		[hage]

---

1. About h- colouring of the vowels in Hindustani, See Firth's Introduction to Harley's Colloquial Hindustani, pp.XV-XVI.
2. Such examples as [kɔh], [gah], [rɔh], [bɔh], [nɔh], [bah] and [nah] are used only in poetry and standard literary prose. (See also M.A.Hai.Thesis, p.127) Also in poetic use the distribution is limited to a preceding [ɔ] and [a]. [h] does however occur in final and in medial positions in other word classes. e.g. [uh], [ah], [jah] , [bah], etc.

2. It is convenient to make an economic and consistent statement of the differences, such as between [haʃe] and [aʃe] and between [hane] and [ane], by treating aspiration in terms of a prosodic element of structure rather than by setting up a different phonematic unit. Being treated prosodically then, aspiration is stated as an exponent of h- prosody, observed in the first syllable in the examples cited above.

V initial stem syllables are, then, either h or $\bar{h}$ prosodic in structure, e.g.

$\overset{h}{\underset{\bar{h}}{}}$V- [haʃe], 'he laughs' [hane] 'he strikes'
[hɔʈe] 'he retreats'.

$\bar{h}$V- [aʃe] 'he comes' [ane] 'he brings'.
[uʈhe] 'he gets up.'

In forms of VC- stem structure h prosodic syllables include ϵ and α units and $\bar{h}$ prosodic syllables ι and α e.g. $^{h}V_2C-$ $^{y/w}\epsilon C-$ [heli], [hoʈi], $^{\circ}\alpha C-$ [hane];

$^{\bar{h}}V_2C-$ $^{w}\iota C-$ [uʈhe], $^{\circ}\alpha C-$[ane].

h and $\bar{h}$ prosodies are stated both for C and V initial syllables, e.g.

$^{h}C-$ [khaʈe] 'he works!
$^{h}V-$ [hane] 'he strikes!
$^{\bar{h}}C-$ [kaʈe] 'he cuts!
$^{\bar{h}}V-$ [ane] 'he brings!

h and $\overline{h}$ as prosodies are stated for stem structures whose initial and final element is a P. For ending structures, however, h and $\overline{h}$ is stated for the structure whose initial element is C- or əC-.

In the ending structures h prosodic syllables are always voiceless, $\overline{h}$ prosodic syllables are either voiced or voiceless. e.g. $\overline{vh}$ -C- [kaʈche], $\overline{vh}$ -C- [kaʈʈe], $\overline{vh}$ -C- [kaɖbe].

In the stem structures both initial and non-initial consonantal articulations in both h and $\overline{h}$ syllables are either voiced or voiceless. Vocalic articulations in both h and $\overline{h}$ syllables are voiced.

Thus,

$\overline{vh}$ C-	[khaʈe]	'he works'.
$\overline{vh}$ C-	[kaʈe]	'he cuts'.
$v\overline{h}$ C-	[gale]	'he strains'.
vh C-	[ghaʈe]	'it decreases'.

Notice that some forms of certain verbs require h prosody as an element of structure, whereas other forms of the verbs do not. e.g.

$\underline{h}$C-	[uʈhe]	'he gets up'.
$\overline{h}$ -C-	[uʈʈe]	'you used to get up'.

This justifies the abstraction of h as a prosody.

7.3.4 r and $\overline{r}$ prosodies.

These prosodies are stated only for syllables whose initial or final C element of structure is the apical plosive unit d. Where r is stated as a prosodic element of structur

the apical plosive articulation is retroflex, the area of contact being zone 5-3. Where $\bar{r}$ is stated as a prosodic element of structure the apical plosive articulation is dental, and is not characterized by dark quality associated with retroflexion, the area of contact being zones 4-1.

r and $\bar{r}$ prosodies are stated for both C- initial and-C# final syllables. Retroflexion and absence of Retroflexion are not the features of the consonantal articulation alone, but are the features of the syllable as a whole. Where r is an element of structure the articulations in the syllable as a whole is characterized by r-Colouring. The presence or absence of r - colouring is observed at the level of perception. During the apical contact in r - syllables the tip of the tongue curls back giving a dark quality to the whole utterance. Palatograms also provide evidence for the apical contact which correlate with the stating of r prosody.

The following pms. are cited in order to illustrate the apical contact in r and $\bar{r}$ syllables:

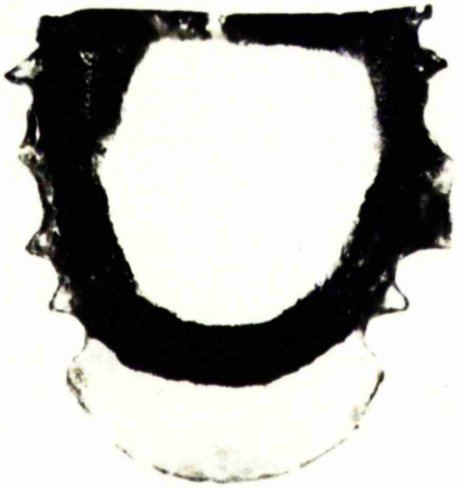
Pm. No.13 [ʈok]

Pm. No. 4 [tap]

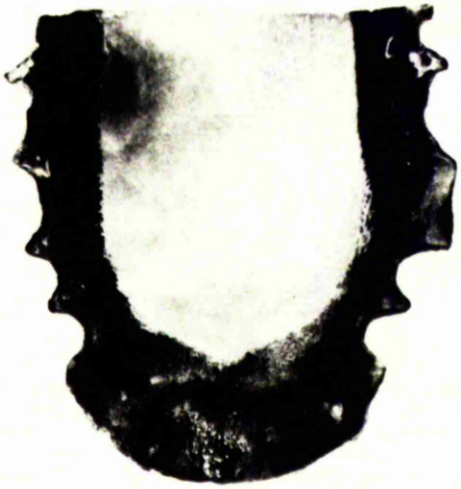
The wipe off in zones 4 and 3 in pm. No.13 correspon to a retracted tongue-tip-up contact against the artificial pal and correlate with the stating of r-prosody for the stem syllable of [ʈok].

It The wipe off in zones 4-1 in pm. No.4. corresponds to the fronter (dental) tongue-tip-contact in the artificial

13. [ʈok]



4. [tap]



palate and correlates with the stating of $\bar{r}$ prosody for the stem syllable of the form [tap].

r/ $\bar{r}$ prosody is stated for the syllable where the phonematic unit d is stated as an element of structure.

r / $\bar{r}$ prosodies are stated only for the stem initial or final and never for the ending. Where r is stated as an element of structure in any stem syllable initial, dark quality characterizes the syllable.[1] Where r- is stated as an element of structure in stem syllable final, the r- colouring characterizes the following syllable if the ending is a -V- or -ə initial structure. In case of C- initial ending the r- quality characterizes the following consonantal and vocalic articulations if the ending initial consonantal articulation is voiced bilabial plosive [-b-] or lateral [-l-]. e.g. [kaɖbe], [kaɭle]. In other cases, r- colouring does not affect the following syllable. This dark quality in articulation culminates in a retroflex apical contact in which the tip of the tongue curls upwards.

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1. It is observed in this thesis that the dark quality in articulation characterizing r- prosodic syllables is not so distinct in Bengali as in other modern Indian languages, and that the retroflex apical contact in most utterances in Bengali is not so far back as the retroflex apical contact in other modern Indian languages, such as Hindi, Marathi, etc. (See B.N.Prasad, Phonetics and Phonology of Bhojpuri; Ph.D.Thesis, Univeristy of London, 1950, and R.K.Rastogi, Nasals and Nasalization in Hindi, M.A.Thesis, University of London, 1960.). M.S. De Silva in his Thesis observes the same features in Sinhalese, as in Bengali. (See M.S.De Silva, The Verbal Piece in Colloquial Sinhalese 'A Phonological Study', Thesis submitted for the degree of M.A. University of London, 1958).

r and $\bar{r}$ prosodic syllables may be further characterized by either voicing or voicelessness, aspiration or absence of aspiration. That is, both r and $\bar{r}$ are elements of structures in stem initial syllables with hv, $\bar{h}v$, $h\bar{v}$ or $\bar{h}\bar{v}$, and in stem final syllables with $\bar{h}\bar{v}$, $h\bar{v}$, $\bar{h}v$ occur. *hv-syllables are not found in stem final position.

Thus,

$r\bar{h}\bar{v}$
-C- [kaṭe]

$rh\bar{v}$
-C- [uṭhe]

$r\bar{h}v$
-C- [kaḍbe]

$\bar{r}\bar{h}\bar{v}$
-C- [pate]

$\bar{r}\bar{h}v$
-C- [kãde]

$\bar{r}h\bar{v}$
-C- [mɔthe]

$\bar{r}hv$
-C- [ʃadhe]

7.3.5 n and $\bar{n}$ prosodies.

Where n is stated as an element of structure, the articulation of the syllable for which it is stated, is characterized by nasality. Where $\bar{n}$ is stated as an element of structure the articulation of the syllable for which it is stated, is characterized by absence of nasality.

This phonetic criteria characterizing the syllables for which n and $\bar{n}$ prosodies are stated, will be discussed with reference to the following kms.

Km. No.2. [nace]

Km. No.1. [kãpe]

Km. No.31 [kace]

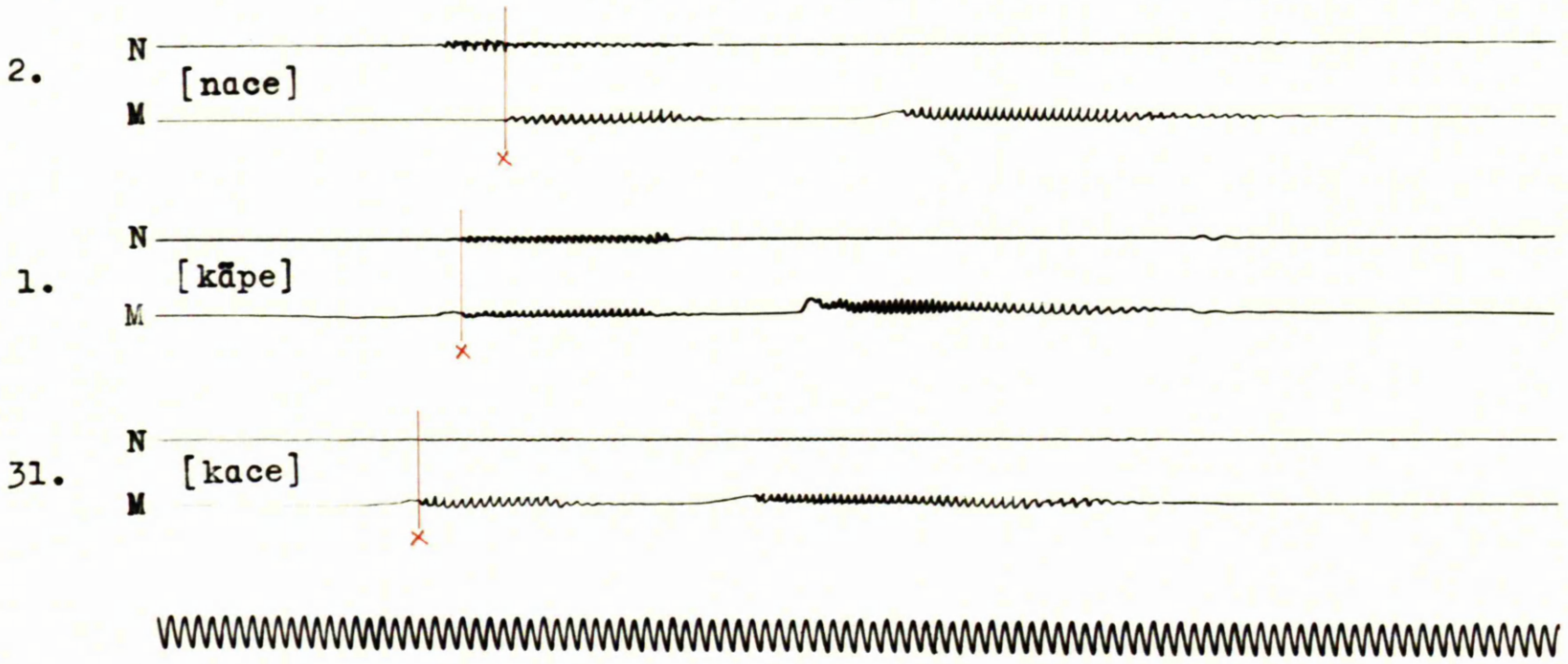
These kms. provide simultaneous nasal (N) and Mouth (M) tracings.

The km. of [nace] shows prominent wave forms on the N line before X, and they continue until before the closure after the vocalic articulation of the first syllable. The km. of [kãpe] shows prominent wave form from the point X and up to the end of vocalic articulation. The km. of [kace] does not show such prominent wave forms on the N line.

Presence of higher amplitude in the wave form on the N line of the forms [nace] and [kãpe] correspond to the nasality in the articulation and absence of higher amplitude of the wave forms on the N line of the form [kace] corresponds to the absence of nasality in the articulation.

For these features of nasality in the articulations of [nace] and [kãpe] n prosody is stated as an element of structure. For the features of absence of nasality, as in the case of [kace] $\bar{n}$ prosody is stated as an element of structure.

It should be noted that $\bar{n}$ prosodic syllables are always v́ prosodic and never $\bar{v}$ prosodic and $\bar{n}$ prosodic syllables may either be v́ or $\bar{v}$ prosodic. n and $\bar{v}$ are therefore mutually exclusive.


2.
N
[nace]
M
1.
N
[kāpe]
M
31.
N
[kace]
M

7.3.6. Prosodies of Junction.

It has been seen that the palatal semi-vowel [y][1] and

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1. [y] represents I.P.A. palatal semi-vowel [j] and [w] represents I.P.A. labio velar semi-vowel [w]. I have consistently used [y] instead of [j] as [j] has been used for I.P.A. [dʒ].

labio-velar semi vowel [w] are not generalized in terms of C-elements of structure. [y] and [w] are stated as exponents of palatal type of linking and labio velar type of linking respectively, which are prosodies of junctions.

7.3.6.1 [y] and [w]

Palatal type of linking (denoted by y) and labio-velar type of linking (denoted by w) which are prosodies of junction characterize the linking feature of stem and ending of the forms in CV + V structure, and the linking feature of the stem syllables in dissyllabic stem structures CVe- .

Thus:

[-e] (Non-finite) ending:

y: $CV^{y}-V$

[diye] 'having given'.

[kheye] 'having eaten'.

[ʃuye] 'having lived'.

[boye] 'having carried'.

[-o] (Imp.Future) ending:

[diyo] 'give!'

[kheyo] 'eat!'

[ʃuyo] 'lie!'

[boyo] 'carry!'

$CV^{y}-eCV$ [-eche] ending

[diyeche] 'he has given'.

[kheyeche] 'he has eaten'.

[ʃuyeche] 'he has lied'.

[boyeche] 'he has carried.'

w:	CV^{w} - V	[dæwa]	'to give'.
		[khawa]	'to eat'.
		[ʃowa]	'to lie'.
		[bɔwa]	'to carry'.
	w: CV^{w} ə-∅	[dæwa]	'cause to give!'
		[khawa]	'cause to eat!'
		[ʃowa]	'cause to lie!'
		[bɔwa]	'cause to carry'
y:	CV^{y} ə-V	[diyie]	'having caused to give'
		[khayie]	'having caused to eat'
		[ʃuiyie]	'having caused to lie'
		[boyie]	'having caused to carry'

Forms in [-eche] ending and Imp. Future [-o] ending show similar feature to those in [-e] ending (non-finite) given above.

w:	CV^{w} ə- V	[dæwae]	'he causes to give'
		[khawae]	'he causes to eat'
		[ʃowae]	'he causes to lie'
		[bɔwae]	'he causes to carry'

37 Forms in [-o] (indicative) ending and -ɛ initial endings show the same feature.

The junction of this structure is also characterized by the absence of these prosodies (i.e. y and w)

CV - V : indicative [-e] ending | indicative [-o] ending
Imperative present [-o] ending

[dæe]	'he gives'	[dæo][1]	'give!'
[khae]	'he eats'	[khao]	'eat!'
[ʃoe]	'he lies'	[ʃoo]	'lie!'
[bɔe]	'he carries'	[bɔo]	'carry!'

So far as the feature of the stem and ending junction of the CV + V structure is concerned, it can be stated as one of the three types:

CV $\underline{y}$ V, CV $\underline{w}$ V, CV-V .

So far as the linking feature of the two syllables of the dissyllabic stem structure CVə- is concerned y or w prosody is stated as a feature between the junction of the two syllables of the stem and not in the junction of stem and ending. In this pattern, however, only y or w prosody is found, their absence is not found as a feature of the linking of the two stem syllables in the forms of a dissyllabic extended stem structure.

y prosody in the junction of the two syllables of the stem structures CV^{y}ə- concerns only the forms in endings non-finite [e], imp. future [-o] and indicative [-che].[2] The forms

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1. Alternative pronunciation [dao].
2. cf. close forms in vowel harmony, ~~§ 10. See~~ Chapter 10.

in all theother endings whether or not initiated by a V, are w- prosodic in stem structure CV^{w} ə-[2]

Thus, ([-e] non-finite ending)

CV^{y} ə - V	[diyie] [1]	'having caused to give'
	[khayie]	'having caused to eat'
	[ʃuyie]	'having caused to lie'
	[boyie]	'having caused to carry'

([-e] indicative ending)

CV^{w} ə - V	[dæwae]	'he causes to give'
	[khawae]	'he causes to eat'
	[ʃowae]	'he causes to lie'
	[bɔwae]	'he causes to carry'
CV^{w} ə - C-	[dæwate]	'you used to cause to give'
	[khawate]	'you used to cause to eat'
	[ʃowate]	'you used to cause to lie'
	[bɔwate]	'you used to cause to carry'

In function, the palatal and labio-velar semi vowels differ considerably from the consonants generalized in terms of C-element of structure. For instance, forms where junction is characterized by y prosody ~~is~~ are in [-e] (non-finite), [-o] (Imp. Future) and [-eche] (indicative) endings. And forms whose junction is characterized by W- prosody ~~is~~ are in [a] ending. That

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1. cf. close forms in vowel harmony. Ch.10.
2. cf. open forms in vowel harmony. Ch.10.

is, in y prosody, syllable one is characterized by frontness or backness and syllable two is also characterized by frontness or backness; and where the junction is w- prosodic, syllable one is characterized by frontness or backness and syllable two is always open neither front nor back. Phonetic expression of the syllable one of the stem structure CV- where y is stated as prosody of the junction, is never opener than half-close; and where w is stated as prosody of the junction, is never more close than half-close. Thus this junction prosody of palatalization and closeness in the stem syllable (and stem syllable one in the case of dissyllabic stem structure CVə -),[1] and prosody of labio-velarization and openness in the stem-syllable[2] are mutually exclusive. The stem syllable is closer in forms whose junction prosody is y and the stem syllable is opener in forms whose junction prosody is w-. The ending syllable in close forms of this structure is half-close in both y- and w- prosodies; the ending syllable is open forms is open neither back nor front in ɒ prosody. These mutual exclusiveness testifies to the validity of handling [y] and [w] in terms of prosodies.

In the dissyllabic stem-structure of the extended forms y or w prosody is stated in the junction of syllable one and two, and not between stem and ending. Where y is stated as prosody of the junction of the syllables one and two, the forms are close forms, and are in endings [-eche]

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1. Infra (next paragraph.)
2. Stem syllable one in the forms of dissyllabic stem pattern CVə-.

(indicative), [-o] (Imp.Future), and [-e] (non-finite). Where w is stated as prosody of the junction of the syllables one and two the forms are open forms and are in all the other endings (than those three mentioned above), ~~united~~ initiated with a V or C.[1]

7.3.6.2 g and $\bar{g}$ prosodies.

g - prosody has the phonetic implication of gemination. Where g is stated as an element of structure, the consonantal articulation following the syllable for which it is stated is characterized by length. Thus [khacche] 'he is eating'

non-g prosody has the phonetic implication of absence of gemination. Where non-g prosody is stated as an element of structure, the consonantal articulation following the syllable for which it is stated is not characterized by gemination. Thus [khetɐ] 'you used to eat'.

g- prosody is stated only where the structure of the stem syllable is open and the ending initiates with [ch-]. g- prosody is stated as an element of structure in the junction of monosyllabic stem structure CV- and all the dissyllabic and trisyllabic stem structures. So far as the CV stem structure is concerned g prosody is stated where the V element of the stem syllable is close unit ɪ , or open unit ɑ . In all the other stem structures the quality of the vocalic articulation of the stem syllable preceding g- prosodic junction is open neutral neither front nor back. e.g.

[kaʧacche] 'he is causing to cut'.

1. See Chapter 10.

Duration for the geminated junction is longer than the non-geminated junction. See Kms. of [khacche] (No.30) and [khete](No.29). The duration of the closure in km. of [khacche] is 17 c.s. and that of [khete] is 13 c.s.[1]

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1. See § 6,2.2.4.

CHAPTER 8

8.0 General Outline.

8.1 Prosodies stated for the ending structure.

8.2 Elements of Phonological structure in ending syllables.

8.3 Table showing the structural patterns of the endings.

8.4 Table showing different C elements of the structural pattern of the endings.

8.5 The Phonological formulae showing the Prosodies of the syllables with examples and grammatical meaning.

8.6 V system in the ending.

CHAPTER 8

Ending Structures

8.0 The verbal forms will be described in terms of stems and endings. Stems and endings are grammatical abstractions and hence are unpronouncable. But they are phonologically justifiable. A particular stem can be generalized as S and all the endings required to be stated can be listed with that stem. Similarly, an ending can be generalized as E and all the statable stems with that ending can be listed in details. Thus, in [piṭte], [kuṭte], [dekte], [tolte], [kaṭte], [bolte], for instance, one can generalize the common ending [-te] as E and make different statement for the stems. Similarly, it is possible to generalize the common stem structure as S and make different statements for the endings, in, as for instance, [piṭte], [piṭle], [piḍbe], [piṭche].

Stems are unlimited in number, but not so the endings. All verbal forms must have one of the limited number of endings. Certain phonological features which characterize the stem structures do not extend to the ending structures; certain phonological features which characterize the ending structures do not characterize the stem. There are again certain features which bind stem and ending together. That is there are features which characterize stem and ending junction.

Endings are either monosyllabic, dissyllabic or trisyllabic in structure. They are either C- initial or V-or

ə- initial and either -C final or -V final. The generalized ending structures stated for the verb are ten in number. They are:

(i) Monosyllabic ending structures:

(a) C- initial : -CV, -CVC

(b) V- initial : V

(c) ə- initial : -əC

(ii) Disyllabic ending structures:

(a) C- initial : CVCV, CVCVC

(b) ə- initial : əCV, əCVC

(iii) Trisyllabic ending structures:

ə initial : əCVCVC

əCVCV.

The following examples will illustrate some of the endings for which these structures are stated.

-CV	[kaʈche]	'he is cutting!.[1]
	[kaʈbe]	'he will cut!
	[kaʈte]	'you used to cut!
	[kaʈle]	'you cut!
-CVC	[kaʈtam]	'I used to cut!
	[kaʈlam]	'I cut!
	[kaʈchiʃ]	'you are cutting!
-V	[kaʈi]	'I cut!
	[kaʈe]	'he cuts!
	[kaʈo]	'you cut!
	[kaʈa]	'to cut!

1. The significance of different tenses and persons are shown in Chapter 1.

-əC	[kaʈiʃ]	'you cut!
	[kaʈen]	'he cuts!
	[kaʈun]	'please cut!'
	[kaʈon]	'to cut!.
-CVCV#	[kaʈchile]	'you were cutting!
	[kaʈchilo]	'he was cutting.
-CVCVC#	[kaʈchilam]	'I was cutting!
	[kaʈchilen]	'he was cutting!
-əCV #	[keʈechi]	'I have cut!
	[keʈeche]	'he has cut!
	[keʈecho]	'you have cut!
-əCVC#	[keʈechiʃ]	'you have cut!
	[keʈechen]	'you have cut!
-əCVCV #	[keʈechile]	'you had cut'.
	[keʈechilo]	'he had cut'.
-əCVCVC	[keʈechilam]	'you had cut'.
	[keʈechilen]	

8.1 Prosodies stated for the ending structure

(1) Prosodies of the syllable as a whole:

y , w and ɒ prosodies

2. Prosodies of the syllable initial and syllable final.

(i) v and $\bar{v}$ prosodies.

(ii) h and $\bar{h}$ prosodies.

(iii) n and $\bar{n}$ prosodies.

The phonetic significance of these prosodies have been stated in the previous chapter. They will not be repeated here.

h and $\bar{h}$ prosodies are stated for the ending initial syllable where the ending initial element is C. Where the initial element of the ending is ə the second syllable of the dissyllabic and trisyllabic ending structures is always h prosodic. h and $\bar{h}$ prosodies are not stated for the final syllable of polysyllabic endings. n and $\bar{n}$ prosodies are stated as an element of structure where the final syllable of the ending is closed, and also for the monosyllabic ending -CV. -CV is the only open ending structure for which n and $\bar{n}$ prosodies are stated.

Where n is stated as an element of structure the final C element of the ending is one of the two nasal units n and m. C in -CV ending structure where n prosody is stated is n unit. Where $\bar{n}$ prosody is stated as an element of structure the final C element of the ending is sibilant unit s in all structures except -əC, where the final C is a three term system of S, P and N.

The generalized statement of endings is made in terms of V (for the vowel system) and ə (for the syllabic system). A general statement of the V units required in this thesis was ~~also~~ made in the previous chapter while dealing with C and V

elements of structure. That statement is applicable to both stems and endings.

It is not, however, possible to make such a general statement of the syllabic elements of structure commonly applicable to stems and endings, for the syllabic systems are set up on their phonological relations within any given structure. The syllabic in the ending is a single term system of ə, which may be read in the formulae as the 'syllabic unit'. One of its phonetic implications is syllabicity.

8.2 Elements of Phonological Structure in ending syllables.

It is important to note that C system in stem syllables is different from that of the ending syllables.

C unit in the stem syllable initial and stem syllable final consists of P_4 , L_2 , S_1 , N_2 $/N_3$. In the stem syllable h/$\underline{h}$, v/$\bar{v}$, r/ $\bar{r}$ and n/ $\bar{n}$ prosodies are recognised.

Initial and final C elements of the ending are restricted to P_3 , L_1 and N_1 (for the initial), P_1 , S_1 and N_2 (for the final), and only h/ $\bar{h}$, v/ $\bar{v}$ and n/ $\bar{n}$ prosodies are stated for ending syllables. r/ $\bar{r}$ prosodies are not stated as elements of structure in the ending.

Only P, L and N are stated for the C element of structure in the ending initial position. P is a three term system in ending initial position. The three phonematic units, $\underline{b}$, $\underline{d}$ and $\underline{j}$ constitute the initial P in the ending structure. For the ending initial where P is stated as an element of structure, h/ $\bar{h}$ and v/ $\bar{v}$ prosodies are stated.

In the structure where the phonematic unit b is stated in the ending initial position, the syllable is always characterised by voicing. In (C) VC- stem structure the whole -C-C- sequence is $v\bar{h}$- prosodic.[1] Where d or j is stated as a phonematic unit in the ending initial position, the whole sequence is $\bar{v}$ prosodic. Where d is stated the -C-C- sequence is always $\bar{h}$ prosodic and where j is stated the -C-C- sequence is always h prosodic.

One phonematic unit l constitutes L in ending initial position.

Where l is a phonematic unit the -C-C- sequence is characterized either by voicing all through, or the first part is characterized by $\bar{v}$ and the second part by v prosody. L-syllables in the ending are always $v\bar{h}$ prosodic.

Thus:

	$\overset{\bar{h}v}{-C - C-}$		
b :		[kaḍbe]	'you/he will cut'.
		[jobbe]	'you/he will mutter'.
	$\overset{\bar{hv}}{-C - C-}$		
d :		[kaṭte]	'you used to cut'.
		[jopte]	'you used to mutter'.
	$\overset{h\bar{v}}{-C - C-}$		
j :		[kaṭche]	' he is cutting'.
		[jopche]	'he is muttering'.
	$\overset{\bar{v}v}{-C - C-}$		
l :		[kaṭle]	'you cut'.
	$\overset{vv}{-C - C-}$	[kãdle]	'you cried'.

The unit $\bar{n}$ constitutes N in ending initial position. This ending functions as a non-finite ending and is used with stem structures whose final element is a -ə, that is, with all dissyllabic and trisyllabic stem structures.

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1. This justifies our taking $v/\bar{v}$ as a prosody of structure.

Thus: $CVC\text{ə} - \overset{n}{C}V$ [kaṭano] 'to cause to cut'.

$CV\text{ə} - \overset{n}{C}V$ [khawano] 'to feed'.

$CVCC\text{ə} - \overset{n}{C}V$ [cimṭano] ' to pinch'.

Plosive unit j constitutes C_1^{1} of dissyllabic and trisyllabic ending structures. The syllable is always h prosodic. Liquid unit l constitutes the C_2^{1} in those structures, and the syllable is $\overline{vh}$ prosodic.

In the final position of ending structure three C elements P, S and N are stated. P is a single term system of g in the ending final position and it is always characterized by $\bar{v}\ \bar{h}$ prosodies. s is a single term system only in ending final position, and is characterized by $\overline{vh}$. N is a two term system in ending final position, n and m. They are characterized by $v\bar{h}$ prosodies. The phonematic units stated for ending final position, the plosive unit g, sibilant unit with s, nasal unit m are not stated as C elements of structure in ending initial position; and the plosive units b , d , j and liquid unit l are not stated as C- element of structure in ending final position. They are in this sense mutually exclusive, so far as distribution is concerned. The nasal unit n is stated as C element of structure in both ending initial and final position.

This is where the structural statement about the stem differs from that of the ending structure.

P_1 : g : $-\overset{\overline{vh}}{C}$ [kaṭuk]

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1. Choosing the numbers to show these distinctions is a purely arbitrary device. The numbers are used in this way for convenient reference of the different Cs in the whole ending structure.

S_1 : s $-C^{\overline{v}\,\overline{h}}$ [kaʈiʃ]

N_2 : n $-C^{v\overline{h}}$ [kaʈun]

: m $-C^{v\overline{h}}$ [kaʈlam]

This is clear, then, from the above discussion that all C units stated for the stem structure are not statable in the ending structure, but all the C units stated for the ending structure are statable in stem structure.

It is important to note that aspiration is a syllable marker in Bengali verbal forms. There can be only one aspirated syllable in the whole ending where it contains alveolo-palatal plosive consonant [-ch].[1] In the whole of the stem also there can not be more than one aspirated consonant. In any verbal form, except some reduplicated forms, the maximum number of aspirated syllables found is two. Where the ending has a [-ch-] in it. Everywhere else a verbal form can not have more than one aspirated syllable. If stem syllable initial is aspirated stem syllable final is never aspirated, and vice versa. Thus,

$^{h}CV^{\overline{h}}$ C-V [khaʈe] , $^{\overline{h}}CV^{h}$ C-V [dæ̀khe] ,

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1. [-chi], [-che], [-cho], [-echi], [-eche], [-echo]; [-chili] [-chile], [-chilo], [-chilen], [chilam]; [-echili], [-echile], [-echilo], [-echilen], and [-echilam] are the endings where aspiration is observed.

$^{h}V\,\bar{h}C\text{-}V$ [haʈe], $\bar{h}\,V^{h}C\text{-}V$ [uʈhe]

$\bar{h}C\,V^{h}C\text{-}\text{ə}\,^{h}CV$ [mekheche] ,

$^{h}CV\text{-}\text{ə}\,^{h}CV$ [kheyeche] ,

$^{h}CVC\text{-}\,^{h}CV$ [khaʈche] .

In reduplicated forms, however, where the stem syllable is repeated, a maximum of three aspirated syllables are possible in a verb.

e.g. $^{h}CV\,\bar{h}C/\,^{h}CV\,C\text{ə}\text{-}\text{ə}\,^{h}CV$ [ghɔrghɔrieche].

8.3. Table showing structural patterns of the endings.

	Trisyllabic endings
I	-ə C V C V_2C
II	-ə C V C V_2
	Disyllabic endings
I	-C V C V_2C
II	-C V C V_2
III	-ə C V_2C_2
IV	-ə C V_2

	Monosyllabic endings
I	$-C_2V_3C_2$
II	$-C_3V_2$
III	$-əC_3$
IV	$-V_3$

8.4. Table showing different C elements of the structural pattern of the endings.

1. Trisyllabic Endings.

I.	-ə C V C V_2C	-ə P V L V_2N_2
II.	-ə C V C V_2	-ə P V L V_2
	2. Dissyllabic Endings	
I.	-C V C V_2C_2	-P V L V_2N_2
II.	-C V C V_2	-P V L V_2
III.	-ə C V_2C_2	-ə P V N -ə P V S
IV	-ə C V_2	-ə P V_2

	3. Monosyllabic Endings	
I.	$-C_2V_2C_2$	$-P_2V\ S$
		$-P_3V_2N_2$
		$(-P_2V_2N_2)$
		$(-P_2V\ N\ )$
		$-L\ V_2N_2$
II	$-C_3V_2$	$-P_3V_2$
		$-\ L\ V_2$
		$-N\ V$
III.	$-\ominus C_3$	$-\ominus S$
		$-\ominus P$
		$-\ominus N$
IV.	$-V_3$	$-V_3$

8.5. The Phonological formulae showing the prosodies of the syllables with examples and grammatical meaning.

1. Trisyllabic ending.

I.	-əP V L V_2N_2	y yv̄h ɒv n -ə j˖ l̲ɑm̲	[bolechilam]	Perfective Past, 1st pers.
		y yv̄h yv n -ə j˖ l̲ɛn̲	[bolechilen]	" 3rd Hon. 2nd Hon.
II.	-əP V L V_2	y yv̄h yv -ə j˖ l̲˖	[bolechili]	" 2nd Fam
		y yv̄h yv -ə j˖ l̲ɛ	[bolechile]	" 2nd Ord.
		y yvh wv -ə j˖ l̲ɛ	[bolechilo]	" 3rd F/O

2. Dissyllabic ending.

I.	-P V L V_2N_2	yv̄h yv n - j˖ l̲ɛn̲	[bolchilen]	Progressive Past 3rd/2nd Hon.
		yv̄h ɒv n -j˖ l̲ɑm̲	[bolchilam][1]	" 1st pers.
II.	-P V L V_2	yv̄h yv -j˖ l̲˖	[bolchili]	" 2nd Fam.
		yv̄h yv -j˖ l̲ɛ	[bolchile]	" 2nd Ord.
		yv̄h wv -j˖ l̲ɛ	[bolchilo]	" 3rd F/O
III.	-ə P V N	y yv̄h n -ə jɛn̲	[bolechen]	Reflect 3/2 Hon. Present
	-ə P V S	y yv̄h v̄h -ə j˖s̲	[bolechiʃ]	" 2nd Fam.

1. For some speakers there are dialectal variations of these forms in the first person: e.g. [bolechilem], [bolechilum], [bolchilem], [bolchilum], [bollem], [bollum], [boltem], and [boltum].

IV	-ə P V_2	y yv̄h -ə j$\overline{\text{ɪ}}$	[bolechi]	" 1st Pers.
		y yv̄h -ə je	[boleche]	" 3rd Ord.
		y wv̄h -ə -je	[bolecho]	" 2nd Ord.

3.
Monosyllabic

I.	-P_2V S.	yv̄h v̄h - dɪ s	[boltiʃ]	Habitual Past, 2nd Familiar
		yv̄h v̄h - jɪ s	[bolchiʃ]	Progressive Present 2nd Fam.
	-$P_3V_2N_2$	ɒv̄h n -dam	[bɔltam][1]	Habitual Past 1st pers.
		yv̄h n -den	[bɔlten]	" 2nd Hon.
		yv̄h n -jen	[bɔlchen]	Prog Pres. 2nd and 3rd Hon.
		yvh̄ n - ben	[bɔlben]	Fut. 2nd and 3rd Hon.
	-L V_2N_2	ɒv n - lam	[bɔllam](1)	Simple Past 1st Pers.
		yv n - len	[bɔllen]	Simp. Past. 2nd and 3rd Pers. Hon.
II.	-P_3V_2	yvh̄ - bɪ	[bolbi]	Fut. 2nd Fam.
		yvh̄ - be	[bolbe]	" 2nd and 3rd Ord.
		wvh̄ - be	[bolbo]	" 1st pers.

1. See foot-note at p. 271

		yv̄h - i̱	[bolchi]	Perf. Pres. 1st pers.
		yv̄h - i∈	[bolche]	" 3rd Pers. Ord.
		wv̄h - i∈	[bolcho]	" 2nd Pers. Ord.
		yv̄h - d∈	[bolte]	Hab. Past. 2nd Ord.
		wv̄h - d∈	[bolto]	" 3rd Ord.
	L V_2	yv - ḻ	[bolli]	Simp. Past. 2nd Fam.
		yv - l∈	[bolle]	" 2nd and 3rd Ord.
		wv - l∈	[bollo]	" 3rd Ord.
	-N V	wnv - n∈	[bolano]	" Non-finite causat. Infinit.
III	-əS	y v̄h - əs	[bolis]	Simp. Pres. Indic. and Pres. Fut. Imp. 2nd Ord.
	-əP	w v̄h - əg	[boluk]	Pres. and Fut. Imp. 3rd Ord.
	-əN	w n - ən	[bolun]	Pres. and Fut. Imp. 3rd Hon.
		y n - ən	[bɔlen]	Simp. Pres. 3rd Hon.
		w n - ən	[bɔlon]	Non. fin. (infin)
IV.	V_3	y - i̱	[boli]	Simp. Pres. 1st. pers.
		y - ∈	[bɔle][1]	Simp. Pres. 3rd Ord.
		y - ∈	[bole][1]	Non-finite

1. See Chapter 10

		$^{w}_{-\ominus}$	[bɔlo]	Simp. Pres. indic. + Pres. Imp. 2nd Ord.
		$^{w}_{-\in}$	[bolo][1]	
		$^{\mathfrak{v}}_{-\alpha}$	[bɔla]	Fut. Impt. 2nd Ord. Non. fin. (infin)

8.6 It will be seen from the above table that in all the formulae of the ending structures, except -əC the final syllable of the ending whose final element is m unit is always $\mathfrak{v}$ prosodic, and where the final element is n unit the syllable is ^{y} prosodic.

There is no ^{w} prosodic syllable in ending structures -əCVCVC, -CVCVC, -əCVC, and -CVC. The syllables in these structures are all y prosodic except where the ending final element is m unit. There the final syllable is $\mathfrak{v}$ prosodic.

Two units, close and mid constitute the final V of the ending structures, -əCVCV, -CVCV,-əCV and -CV. $\backepsilon$ is in y prosodic syllable and $\in$ is in ^{y} and ^{w} syllables. Where the final C in ending structures CVC, əCVC, CVCVC and əCVCVC is s unit, the final V is $\backepsilon$ unit in y prosodic syllable and where it is n unit the V is $\in$ unit in y prosodic syllable and where it is m unit the V is α unit in $\mathfrak{v}$ prosodic syllable

Monosyllabic ending structure V is a three term system of close, mid and open. $\backepsilon$ is in y syllable $\in$is in both ^{y} and ^{w} prosodic syllable and α is in $\mathfrak{v}$ prosodic syllable.

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1. See Chapter 10 for phonetic expression of the forms in endings [-e](non-finite), [-ə](indicative)and [-e](imperative) present), and [-o] (imperative future).

CHAPTER 9

STEM STRUCTURES

9.0 General outline.

9.1 Different stem structures.

9.2 Prosodies stated for stem syllables.

9.3 ə element of structure in stem final syllable.

9.4 V element of structure in stem initial syllable.

9.4.0 Table showing the Summary of structural patterns of the stems and endings.

9.4.1 Stem structure CVC-

9.4.2 Stem structure VC-

9.4.3 Stem structure CV-

9.4.4 Stem structure CVCə-

9.4.5 Stem structure VCə -

9.4.6 Stem structure CVə-

9.4.7 Stem structure CV$\widehat{CC}$ə-

9.4.8 Stem structure V$\widehat{CC}$ə-

CHAPTER 9

STEM STRUCTURES

9.0 Here a statement of the structure required to be set up for the stem and junction will be made. Stem and junction are taken together in order to focus attention on the phonological correspondences and differences between different grammatical categories.[1]

The syllables in the whole structures are stem syllables and ending syllables. The linking feature of the stem and ending is referred to as junction. Stems and endings are grammatical abstractions. The phonological statement will be made on the basis of phonetic observations, and in doing so the utterance as a whole has been taken into consideration, and not any segment. For stems are unpronouncable.[2]

9.1 Stems are either C initial or V initial and either C final, V final or ə final. Stems are monosyllabic, dissyllabic or trisyllabic. Following are the generalized stem structures:

Monosyllabic: CVC-, VC- and CV-.[3] These monosyllabic stems will also be called radical stems.[4]

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1. For Gram. Categories See Ch. I - III.
2. Stems and endings are treated separately, for endings are limited in number but not so are the stems.
3. There is also a stem structure V whose indicative forms are found only in Simple Past tense and Imperative form in the Present tense. They are [elam], [ele], [elen], [eli], [elo] and [ae]. This structure is not included among the generalized structures.
4. CVC-, VC- and CV- stem patterns I term 'Radical Stem', CVCə- VCə- and CV- stem patterns I term 'Extended Stem'. Radical stem patterns are monosyllabic, extended stem patterns are dissyllabic. There are two other dissyllabic stem patterns CV͡CCə- and V͡CCə- which are not 'extended' in the sense CVCə-, VCə- and CVə- stem patterns are extended.

Dissyllabic: CVCə-,[1] VCə- and CVə-; these will be called extended stems; and CV͡CCə-, and VC͡Cə-, these will be called non-extended stems.

Trisyllabic: Trisyllabic stems CVC/CVCə are found only in the reduplicated forms.

The following examples will illustrate the different stems structures. For the purpose of illustration forms with ending [-lam] are taken.

Stem structure	CVC-	[bɔʃlam]	'I sat'.
Stem structure	VC-	[anlam]	'I brought'.
" "	CV-	[khelam]	'I ate'.
" "	CVCə-	[bɔʃalam]	'I caused (some one) seated'.
" "	VCə-	[analam]	'I made some one bring'.
" "	CVə-	[khawalam]	'I fed'.
" "	CV͡CCə-	[kamʈalam]	'I bit'.
" "	VC͡Cə-	[acʈalam]	'I brushed (hair)'.
" "	CVC/CVCə-	[piʈpiʈalam]	'I winked'.

A Bengali verbal form can have a maximum of six syllables in reduplicated forms, and five syllables in forms of other stem structures. e.g. [piʈiechilam].

For phonological statement the stem structures will be treated under the heads: CVC-, VC-, and CV-, CVCə-, VCə, CV͡CCə-, VC͡Cə-, and CVC/CVCə.

Monosyllabic (or radical) stem patterns CVC-, VC- and CV- are restricted to non-causative verbs; extended dissyllabic stem patterns CVCə-, VCə- and CVə- to causative verbs and

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1. For details about ə, see Ch. 7. Elements of the phonological analysis.

the dissyllabic stem patterns CVC͡Cə- and VCCə- and reduplicated stem pattern CVC/CVCə- function both in causative and non-causative.

The vocalic element that is observable in the second syllable in all dissyllabic (extended and non-extended)stems and the third syllable of in reduplicated stems is syllabic and represented by ə (schwa).

In the following phonological statement 'junction' will be used to denote the linking feature of the stem and ending. In the forms of the monosyllabic stem patterns the first syllable of the form is referred to as stem syllable, in the dissyllabic stem patterns the first two syllables of the forms will be referred to as stem syllable one, and stem syllable two, and in the trisyllabic stem patterns the first three syllables of forms will be referred to as stem syllable one, two and three respectively.

Thus, in the form [kaṭe] first syllable is referred to as stem syllable and the second syllable as the ending syllable. The junction is shown by a hyphen in between the stem and ending, as CVC-V. In the form [kaṭae], the first two syllables are stem syllables one and two respectively and the junction is between stem syllable two and ending, as CVCə-V. In the form [piṭpiṭae] the first three syllables are stem syllable one, two and three respectively and the junction is between the stem-syllable three and the ending as CVC/CVCə-V.

A common phonematic structure for all forms of any given scatter can not be stated for the stem. The phonological differences between these forms include differences in the

vowel element as well as differences in the prosodic elements of the stem.

Thus, in the forms [kaţe] and [keţe] of the same scatter, for instance, two phonematic units - ɑ - and - ∈ - respectively are stated in the generalized stem structure CVC-. The stem syllable of the form [kaţe] is ɒ prosodic and that of [keţe] is ^{y} prosodic.

9.2 In order to focus attention on the phonological features distinguishing one grammatical form from another the following prosodies will be stated:

y , w, ɒ [1]

Phonetic qualities such as frontness and backness, lip-rounding and unrounding are stated as exponents of the whole syllable, and not characteristic of the vocalic or consonantal articulations alone. Being stated prosodically for the syllable as a whole these qualities refer to V and C phonematic units in their combinations in syllables.

It has already been said that it is not possible to state where one syllable ends and another begins, and the relevant observations are made by taking whole utterances which are chosen as comparable. As y, w and ɒ prosodies characterize both C initial and V initial syllables, I will not discuss here the C- elements of structure in details. The generalized term C is used where a C element is to be stated.

As y, w or ɒ prosodies characterizes every syllable,

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1. Phonetic implications of these prosodic markers are discussed in Ch. 7 dealing with elements of phonological analysis.

and as every syllable involves a V or a ə element of structure I propose to state the V and ə system in detail of the verbs chosen for the present discussion. Verbs of different stem structures will be chosen with finite endings [-i], [-e], [-o], [-che] and [-te] and imperative future [-o], and non-finite [-e] and [-a]. Forms with non-finite [-a] are not found in dissyllabic stem structures. Forms with ending structure -CV are chosen for the all the dissyllabic stem structures and for the monosyllabic stem structure CV-, in order to show relation with the stem-syllable and the ending structure -CV.

9.3 ə element of structure in the stem syllable.

One syllable unit ə is stated in the second syllable of all dissyllabic stem structures and in the third syllable of reduplicated stems. The syllable where ə is stated as an element of structure is either ɔ prosodic or y prosodic. The phonetic expression of ə in syllable two in the forms in stem structures, CVCə-, VCə-, CVə-, $C\overset{\frown}{V}C\overset{\frown}{C}$ə-, and $V\overset{\frown}{C}C$ə- or in syllable three of CVC/CVCə- structure is either an open neutral vowel neither front nor back, or a front vowel between half-close and half-open.

9.4 V element of structures.

All stems include in their structures a V element. A statement of the system subsumed under V can be made in terms of three categories relating to degree of openness. The number of V units required for the present statement is three, viz., ι the close unit, ∈ the mid unit, α the open unit. These

three are stated as the maximum number of units for the stem syllable whose nucleus is generalized as V. All the vowel qualities observed in the utterance can be stated in terms of these three categories.

Thus:	CV_3C	+		
	CɩC	+ [-i]	[piʈi]	' beat'.
		+ [-i]	[tuli]	'I raise'.
	C∈C	+ [-i]	[dekhi]	'I see'.
		+ [-e]	[tole]	'he raises'.
	CɑC	+ [-e]	[dɒkhe]	'he sees'.
		+ [-e]	[kaʈe]	'he cuts'.
		+ [-e]	[bɔle]	'he says'.

For convenience of phonological statement (i) structural patterns of stems and endings will be shown in tabular form, and then (ii) the prosodies of the stem syllables and of junction with phonematic units of the V element of structure will be set out together with some forms in phonetic transcription for every structure separately, in order to show the phonological correspondence and differences between forms of the verbal scatter belonging to each stem structure.

9.4.0 Summary of the structural patterns of the stems and endings.

I.	$y/w/\not{o}$ CV_3C	+	$y/w/\not{o}$ V_3
II.	$y/w/\not{o}$ V_3C	+	$y/w/\not{o}$ V_3
III.	$y/w/\not{o}$ CV_3	+	$y/w/$ V_{3y}
		+	CV
IV.	$y/w/\not{o}$ $CV_3C\ominus$	+	y/w V_2
		+	CV^{y}
V.	$y/w/\not{o}$ $V_3C\ominus$	+	y/w V_2
		+	CV^{y}
VI.	$y/w/\not{o}$ $CV_3\ominus-$	+	y/w V_2
		+	CV^{y}
VII.	$y/w/\not{o}$ $C\,V_3\widehat{CC}\ominus$	+	y/w V_2
		+	CV^{y}
VIII.	$w/\not{o}$ $V_2\widehat{CC}\ominus-$	+	y/w V_{2y}
		+	CV

9.4.1 Table[1] showing the partial phonological formulae of the stem structure CVC- with different endings.

CV_{3}-V	y/w/ø + [-i][1a]	+ [-e][1b]	+[-o][1c]	+[-e][1d]	+[-o][1e]	+[-a][1f]
1.	y C◡C-	y C◡C-	y C◡C-	y C∈C-	y C∈C-	y C∈C-
2	w C◡C-	w C◡C-	w C◡C-	w C∈C-	w C∈C-	w C∈C-
3	y C∈C-	y C∈C-	y C∈C-	y CɑC-	y CɑC-	y CɑC-
4	w C∈C-	w C∈C-	w C∈C-	w CɑC-	w CɑC-	w CɑC-
5	ø CɑC-	y C∈C-	y C∈C-	ø CɑC-	ø C ɑC-	ø CɑC-
1.	[piṭi]	[piṭe]	[piṭo]	[peṭe][2]	[peṭo][2]	[peṭa][2]
2.	[ṭuli]	[ṭule][3]	[tulo][3]	[tole][3]	[tolo][3]	[tola]
3.	[kheli]	[khele]	[khelo]	[khæle]	[khælo]	[khæla]
4.	[boli]	[bole]	[bolo]	[bɔle]	[bɔlo]	[bɔla]
5.	[kaṭi]	[keṭe]	[keṭo]	[kaṭe]	[kaṭo]	[kaṭa]

1. See I in the previous table.
2. Alternative pronunciation [piṭe], [piṭo] and [piṭa].
3. These differences in the stem syllable of the forms with phonetically similar but grammatically different endings are discussed in details in the ~~following~~ chapter on vowel harmony.
~~See also footnotes on page~~

1 a. [-i] Simple present, ~~person~~ 1st person.

1 b. [-e] Non-finite.

1 c. [-o] Imperative future, 2nd person, ordinary grade.

1 d. [-e] Simple present, 3rd person, ordinary grade

1 e. [-o] Simple present, 2nd person, ordinary grade.

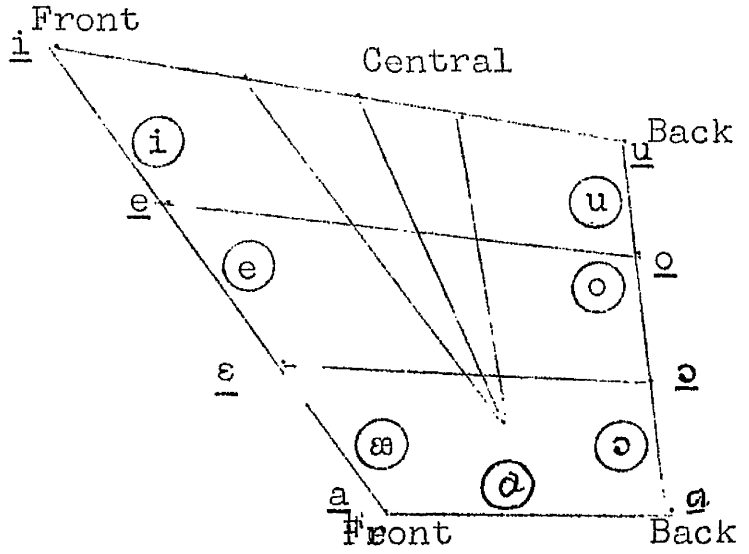
1 f. [-a] Non-finite.

It will be seen from the formulae set out in the table above that the stem syllable of the forms with all the endings is characterized by ^{y}, ^{w} or $^{\circ}$ prosody. In categories where the phonological features of the stem syllable correspond, as shown by putting them in one line in the table, the differences are in the endings only.

A generalized statement of all stems involves a term in a V system. So far as the structure of CVC+ Endings is concerned, V involves a three term system, vize, close unit, mid unit and open unit.

The syllable in the formulae where $^{y}\iota$ is stated is characterized by front quality between close and half-close, and absence of liprounding in articulation, where $^{w}\iota$ is stated by a back quality between close and half-close and liprounding in articulation. The syllable where $^{y}\in$ is stated is characterized by a front quality between half-close and half-open, and where $^{w}\in$ is stated is characterized by a back quality between half close and half open with liprounding in articulation. The syllable where $^{y}\alpha$ is stated the quality of the syllable is between half-open and open front without liprounding, where $^{w}\alpha$ is stated the quality of the syllable is between half open and open back with lip rounding and where $^{\circ}\alpha$ is stated the quality of the syllable is open neutral neither front nor back without lip-rounding in articulation. The vocalic qualities observed in the stem syllable can be shown in the following vowel diagram with reference to the pronunciation of the forms [piṭi], [tuli], [kheli], [boli]

[kʰæɭe], [bɔɭe] and [kaɭi].



9.4.2 Table showing stem structure [1] $y/w/\upsilon\ V_3C-$

	+ [-i]	+ [-e]	+ [-o]	+ [-ɛ]	+ [-ɔ]	+ [-a]
1.	$^{w}{}_{\iota}C-$	$^{w}{}_{\iota}C-$	$^{w}{}_{\iota}C-$	$^{w}{}_{\in}C-$	$^{w}{}_{\in}C-$	$^{w}{}_{\in}C-$
2.	$^{y}{}_{\in}C-$	$^{y}{}_{\in}C-$	$^{y}{}_{\in}C-$	$^{y}{}_{\alpha}C-$	$^{y}{}_{\alpha}C-$	$^{y}{}_{\alpha}C-$
3.	$^{w}{}_{\in}C-$	$^{w}{}_{\in}C-$	$^{w}{}_{\in}C-$	$^{w}{}_{\alpha}C-$	$^{w}{}_{\alpha}C-$	$^{w}{}_{\alpha}C-$
4.	$^{\upsilon}{}_{\alpha}C-$	$^{y}{}_{\in}C-$	$^{y}{}_{\in}C-$	$^{\upsilon}{}_{\alpha}C-$	$^{\upsilon}{}_{\alpha}C-$	$^{\upsilon}{}_{\alpha}C-$
1.	[uɬhi]	[uɬhe]	[uɬho]	[oɬhe]	[oɬho]	[oɬha] [2]
2.	[heɭi]	[heɭe]	[heɭo]	[hæɭe]	[hæɭo]	[hæɭa]
3	[hoɬi]	[hoɬe]	[hoɬo]	[hɔɬe]	[hɔto]	[hɔɬa]
4.	[ani]	[ene]	[eno]	[ane]	[ano]	[ana]

1. See II in Table on page 282
2. Alternative Pronunciation [uɬha].

All three V units, close, mid, open are stated for the generalized V in stem pattern VC-. The close unit involves only the back rounded vowel.

It will be seen from the examples set up above that the vowel units ɨ, ∈ and α of the VC- stem pattern do not show any phonetic peculiarities other than those associated with those of the CVC- stem patterns. The stem syllables of the forms in all the endings ~~is~~ are characterized by y, w or ɔ prosody. The syllable where ɨ unit is stated is always w prosodic and never y prosodic. Other two units, ∈ and α are in both y and w prosodic syllables. α unit is ~~also~~ stated in ɔ prosodic syllables.

The vocalic qualities of the stem syllables of the forms given above of VC- stem structure are similar to those in the CVC- stem structure with different endings.

9.4.3 y/w/ɔ CV_3.. Stem structure.[1]

Table showing the partial phonological formulae of the stem and junction with different endings.

	-[-i]	-[-e]	-[-o]	-[-e]	-[-o]	-[-a]	[-cho]	-[-te][2]
1.	y Cɨ-	yCɨ-	yCɨ-	yCα-	yCα-	yCα- w	yCɨ- g	yCɨ-
2.	w Cɨ-	wCɨ- y	wCɨ- y	w C∈-	w C∈-	w C∈- w	wCɨ- g	wCɨ-
3.	w C∈-	w y C∈-	w y C∈-	w Cα-	w Cα-	w Cα- w	w y C∈-	w y C∈-
4.	ɔ Cα-	y y C∈-	y y C∈-	ɔ Cα-	ɔ Cα-	ɔ Cα- w	ɔ g Cα-	ɔ Cα-

182. See note 182 on page 287

	3		4				
1.	[dii]	[die]	[dio]	[dœe]	[dɑo]	[dœwa]	[dicche]	[dite]
2.	[ʃui]	[ʃuye]	[ʃuyo]	[ʃoe]	[ʃoo]	[ʃowa]	[ʃucche]	[ʃute]
3.	[boi]	[boye]	[boyo]	[bɔe]	[bɔo]	[bɔwa]	[boiche]	[boyte]
4.	[pai]	[peye]	[peyo]	[pae]	[pao]	[pawa]	[pacche]	[pete]

All three V units, close, mid and open ɩ , ɛ and ɑ are stated for the stem syllable in CV- stem structure. The close unit involves both front unrounded and back rounded vowels; the mid unit involves both front unrounded and back rounded vowels between half-close and half-open; the open unit involves front unrounded vowel between half-open and open, back rounded vowel between half-open and open, and open neutral unrounded vowel which is neither front nor back.

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1. See III in Table on page
2. Forms with endings [-che] and [-te] are used in this and all subsequent sections. They are introduced in order to show g and non-g prosodic junction with -CV ending structures. Forms in these ending structures are not found relevant in establishing V unit of structures in the stem initial syllable, hence they are not used in sections I and II.
3. Alternative pronunciation [dei].
4. Alternative pronunciation [dao].

table that the forms of the scatters 2, 3 and 4 in column two and three with [-e] and [-o] ending, and all the forms in columns six and seven in [-a] and [-che] endings involve a junction prosody which has been denoted in the formulae by placing the prosodic symbol y, w , or g after the syllable. These prosodies are stated for the junction and these symbols are placed in this position because the articulation concerned is the linking feature between the stem and ending. The characteristic feature of y, w or g prosody cannot be ascribed to any particular syllables as such, but may be considered as a feature of what binds the stem and ending together; hence the symbol is placed between the stem and ending. So far as g prosody is concerned, it has been found that the consonantal articulation involved is the ending initial consonant. It may be said, therefore, that where g prosody is stated the long consonantal articulation is in the syllable that follows, and hence g is placed between the two syllables in question. To say that y-, w or g is a prosody of such and such a syllable is for convenience. It is in fact a prosody of a piece of two syllables. It has already been mentioned that g prosody is stated ~~of~~ the junction of the structure where the ending is initiated by [-ch] and the stem syllable is open.

So far as the junction of CV- stem structure is concerned g prosody is stated with only ι , and α units and never with $\in$ unit in the preceding syllable. And for the form of the scatter 3, y prosody is stated as a prosody of the junction where the ending initial is a C (whether or not [-ch]). That is

the junction of
y prosody is stated for all the forms of the scatter whose stem syllable is mid and w prosodic, so far as the forms with the ending structure -CV is concerned. In the junction of the forms of scatters 2 and 4, with ending nonfinite [-e], and imperative future [-o] y prosody is stated. w- prosody is stated for all the forms of the scatters with [-a] ending.

Phonetically each of the vowels [i], [u], [o] and [a] of the forms [dii], [ʃui], [boi], and [pai] forms the starting point of the diphthong which moves in the direction of [i]; [æ], [o] [ɔ] [a] of the forms [dæe] [ʃoe], [bɔe] and [pae] forms the starting point of the diphthong which moves in the direction of [e]; [æ], [o], [ɔ], and [a] of the forms [dæo] [ʃoo] [bɔo] and [pao] form the strating point of the diphthong which moves in the direction of [o]. These diphthongs are described in Chapter 4.

9.4.4 $^{y/w/ø}CV_3Ce-$ [1]

	+[i]	+[e]	+[o]	+[e]	+[o]	+[-cho]	+[te] [2]
1	y ø C∈Ce-	y y C↓Ce-	y ẏ C↓Ce-	y ø C∈Ce-	y ø C≡Ce-	y ø g C≡Ce-	ẏ ø i C∈Ce-
2.	y ø CαCe-	y y C∈Ce-	y y C∈Ce-	y ø CαCe-	y ø CαCe-	y ø g CαCe-	y ø CαCe-
3	ø CαCe-	y CαCe+	y CαCe-	ø ø CαCe-	ø CαCe-	ø g CαCe-	ø CαCe-
4.	w ø CαCe-	w y C∈Ce-	w y C∈Ce-	w ø CαCe-	w ø CαCe-	w ø g CαCe-	w ø CαCe-
5.	w ø C∈Ce-	w y C↓Ce-	w y C↓Ce-	w ø C∈Ce-	w ø C≡Ce-	w ø g C≡Ce-	w ø C≡Ce-

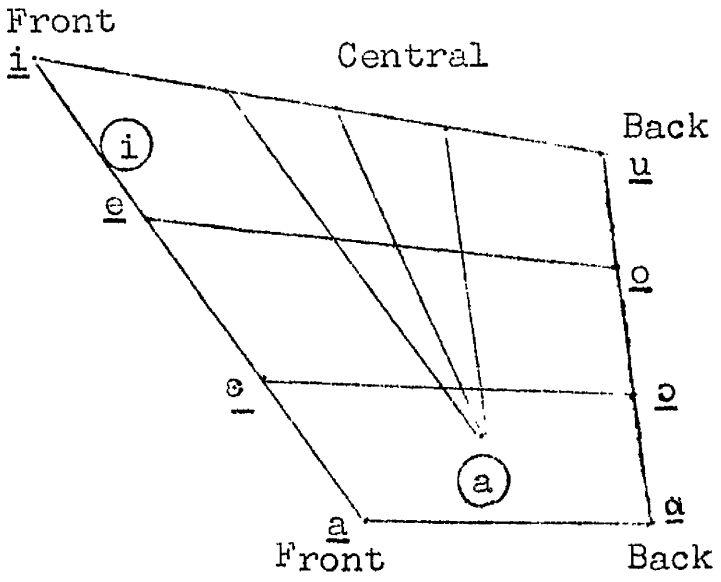
1. See note 1, page 290 2. See note 2, p. 290

	[3]		[4]	[5]	[6]	[7]
1.	[peţai]	[piţie]	[piţio]	[peţae]	[peţao]	[peţacchɐ]	[peţate]
2.	[khælai]	[khelie]	[khelio]	[khælae]	[khælao]	[khælacchɐ]	[khæţate]
3.	[kaţai]	[kaţie]	[kaţio]	[kaţae]	[kaţao]	[kaţacchɐ]	[kaţate]
4.	[bɔlai]	[bolie]	[bolio]	[bɔlae]	[bɔlao]	[bɔlacchɐ]	[bɔlate]
5.	[tolai]	[tulie]	[tulio]	[tolae]	[tolao]	[tolacchɐ]	[tolate]

The formulae are self explanatory and need not be detailed here. It will be seen that the stem syllable of the forms with all the endings in either y, w, or ɑ prosodic Syllable two, where ɔ is stated as an element of structure, is ɔ or y prosodic or ɔg- prosodic. Where the ending is non-finite [-e] or imperative future [-o] the second syllable is y prosodic, everywhere else it is ɔ prosodic. Where the ending is [-ch-] initial of the ending structure -CV the junction is also characterized by g prosody.

The vocalic qualities of the stem syllable one are similar to those shown in connection with the statement of the CVC- stem structure and need not be repeated here. The vocalic qualities observed in syllable two of the forms where y or ɔ is stated as an element of structure are shown in the following vowel diagram with reference to my pronunciation of the forms

1. See IV in table on page 282
2. Forms with endings [-che] and [-te] of the -CV ending structure are used in this and subsequent sections, in order to show the junction prosodies.
3. Alternative pronunciation [piţai] [piţui] [peţui]
4. " " [piţae] [piţoe] [peţoe]
5. " " [piţao] [piţoo] [peţoo]
6. " " [piţacche] [piţucche]
7. " " [piţate] [piţute]



9.4.5 y/w/ɔ ^{1} V_3 Cə-

	[-i]	[-e]	[-o]	[-e]	[-o]	[-che]	[-te]
1.	α ɔ ∈Cə-	w y ι Cə-	w y ι Cə-	w ɔ ∈Cə-	w ɔ ∈Cə-	w ɔ g ∈Cə-	w ɔ ∈Cə-
2.	ɔ ɔ αCə-	ɔ y αCə-	ɔ y αCə-	ɔ ɔ αCə-	ɔ ɔ α Cə-	ɔ ɔg αCə-	ɔ ɔ αCə-
3.	y ɔ αCə-	y y ≡Cə-	y y ∈Cə-	y ɔ αCə-	y ɔ αCə-	y ɔg αCə-	y ɔ αCə-
4.	w ɔ αCə-	w y ≡Cə-	w y ∈Cə-	w ɔ αCə-	w ɔ αCə-	w ɔg αCə-	w ɔ αCə-

1. See V in table on page 282

	1			2	3	4	5
1.	[oʈhai]	[uʈhie]	[uʈhio]	[ɔʈhae]	[oʈhao]	[oʈhacche]	[oʈhate]
2.	[anai]	[anie]	[anio]	[anae]	[anao]	[anacche]	[anate]
3.	[hælai]	[helie]	[helio]	[hælae]	[hælao]	[hælacche]	[hælate]
4.	[hɔtai]	[hoʈie]	[hoʈio]	[hɔtae]	[hɔtao]	[hɔtacche]	[hɔtate]

The forms of these structures do not show any difference from those in structure CVCe-.[6] Forms in this structure exclude ι in y prosody in the stem syllable one. All three units ι, ∈ and α are stated for the stem syllable one. ι is in w, ∈ in ^{y} and ^{w} and α in ^{y}, ^{w} and ^{o} prosodic syllable.

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1. Alternative pronunciation [uʈhai] [uʈhai] [oʈhui]
2. " " [uʈhae]
3. " " [uʈhao] [uʈhoo] [oʈhoo]
4. " " [uʈhacche] [uʈhocche] [uʈhecche]
5. " " [uʈhate] [uʈhote]
6. See II VC- Stem structure, p. 282

9.4.6 y/w/ø CV_3ə- [1]

	[-i]	[-e]	[-o]	[-ɔ]	[-o]	[-che]	[-te]
1.	y ɔ Cɩə-	y y y Cɩə-	y y y Cɩə-	y ɔ Cɩə-	y ɔ Cɩə-	y ɔg Cɩə-	y ɔ Cɩə-
2.	y w ɔ Cɑə-	y y y Cɩə-	y y y Cɩə-	y w ɔ Cɑə-	y w ɔ Cɑə-	y w ɔg Cɑə-	y w ɔg Cɑə-
3.	ɔ w ɔ Cɑə-	ɔ y y C∈ə-	ɔ y y C∈ə-	ɔ w ɔ Cɑə-	ɔ w ɔ Cɑə-	ɔ w ɔg Cɑə-	ɔ w ɔg Cɑə-
4.	w w ɔ Cɑə-	w y y C∈ə-	w y y Cɑə-	w w ɔ Cɑə-	w w ɔ Cɑə-	w w ɔg Cɑə-	w w ɔ Cɑə-
5.	W w ɔ C∈ə-	w y y Cɩə-	w y y Cɩə-	w w ɔ C∈ə-	w w ɔ C∃ə-	w w ɔg C∈ə-	w w ɔ C∈ə-

	[2]	[3]	[4]	[5]	[6]
1.	jiai] [jiyie]	[jiyio]	[jiae]	[jiao]	[jiacche]	[jiaţe]
2.	[dæwai]	[diyie]	[diyio]	[dæwae]	[dæwao]	[dæwacche]	[dæwaţe]
3.	[pawai]	[payie]	[payio]	[powae]	[pawao]	[pawacche]	[pawaţe]
4.	[bɔwai]	[boyie]	[boyio]	[bɔwae]	[bɔwao]	[bɔwacche]	[bɔwaţe]
5.	[ʃowai]	[ʃuyie]	[ʃuyio]	[ʃowae]	[ʃowao]	[ʃowacche]	[ʃowaţe]

1. See VI on table on page 282
2. Alternative pronunciation [jɯi]
3. " " [jioe]
4. " " [jioo]
5. " " [jiucche]
6. " " [jiute]

Forms in this structure exclude ∈ in y prosody in the stem syllable one. There is a linking feature between the stem syllable one and two in the forms of all the scatters except ji-.[1] In all the forms with endings non-finite [-e] and imperative future [-o] this linking of the two syllable is y prosodic, everywhere else it is w prosodic. The junction prosody of stem and ending is similar to that of the CVCə- or VCə- stem structure. All three units ι , ∈ and α are stated for the stem syllable one. ι is in $^{y/w}$, ∈ is in ^{w} and α is in $^{y, w \text{ or } ɔ}$ prosodic syllable.

9.4.7 $\underline{(C)VC\widehat{C}ə}^{y/w/ɔ}$ [2]

	[-i]	[-e]	[-o]	[-ə]	[-o]	[-che]	[-te]
1.	$^{y}\ ^{ɔ}$ $C_ι\widehat{C}Cə-$	$^{y}\ ^{y}$ $C_ι\widehat{C}Cə-$	$^{y}\ ^{y}$ $C_ι\widehat{C}Cə-$	$^{y}\ ^{ɔ}$ $C_ι\widehat{C}Cə-$	$^{y}\ ^{ɔ}$ $C_ι\widehat{C}Cə-$	$^{y}\ ^{ɔg}$ $C_ι\widehat{C}Cə-$	$^{y}\ ^{ɔ}$ $C_ι\widehat{C}Cə-$
2.	^{y} $C_α\widehat{C}Cə-$	$^{y}\ ^{y}$ $C_∈\widehat{C}Cə-$	$^{y}\ ^{y}$ $C_∈\widehat{C}Cə-$	$^{y}\ ^{ɔ}$ $C_α\widehat{C}Cə-$	$^{y}\ ^{ɔ}$ $C_α\widehat{C}Cə-$	$^{y}\ ^{ɔg}$ $C_α\widehat{C}Cə-$	$^{y}\ ^{ɔ}$ $C_α\widehat{C}Cə-$
3.	^{ɔ} $C_α\widehat{C}Cə-$	$^{ɔ}\ ^{y}$ $C_α\widehat{C}Cə-$	$^{ɔ}\ ^{y}$ $C_α\widehat{C}Cə-$	$^{ɔ}\ ^{ɔ}$ $C_α\widehat{C}Cə-$	$^{ɔ}\ ^{ɔ}$ $C_α\widehat{C}Cə-$	$^{ɔ}\ ^{ɔg}$ $C_α\widehat{C}Cə-$	$^{ɔ}\ ^{ɔ}$ $C_α\widehat{C}Cə-$
4.	^{w} $C_∈\widehat{C}Cə-$	$^{w}\ ^{y}$ $C_ι\widehat{C}Cə-$	$^{w}\ ^{y}$ $C_ι\widehat{C}Cə-$	$^{w}\ ^{ɔ}$ $C_∈\widehat{C}Cə-$	$^{w}\ ^{ɔ}$ $C_∈\widehat{C}Cə-$	$^{w}\ ^{ɔg}$ $C_∈\widehat{C}Cə-$	$^{w}\ ^{ɔ}$ $C_∈\widehat{C}Cə-$
5.	^{w} $C_α\widehat{C}Cə-$	$^{w}\ ^{y}$ $C_∈\widehat{C}Cə-$	$^{w}\ ^{y}$ $C_∈\widehat{C}Cə-$	$^{w}\ ^{ɔ}$ $C_α\widehat{C}Cə-$	$^{w}\ ^{ɔ}$ $C_α\widehat{C}Cə-$	$^{w}\ ^{ɔg}$ $C_α\widehat{C}Cə-$	$^{w}\ ^{ɔ}$ $C_α\widehat{C}Cə-$

1. In columns 2 and 3 forms of ji- scatter are y prosodic in the linking of two syllables.
2. See VII table on page 282

1.	[cimʈai]	[cimʈie]	[cimʈie]	[cimʈae]	[cimʈao]	[cimʈacche]
2.	[bhæɲcai]	[bheɲeie]	[bheɲcio]	[bhæɲcae]	[bhæɲcao]	[bhæɲcacche]
3.	[paltai]	[palʈie]	[palʈio]	[palʈae]	[palʈao]	[palʈacche]
4.	[ʈhokrai]	[ʈhukrie]	[ʈhakrio]	[ʈhokrae]	[ʈhokrao]	[ʈhokracche]
5.	[pɔstai]	[postie]	[postio]	[pɔstae]	[pɔstao]	[pɔstacche]

The stem syllable one is characterized by $^{y,\ w}$ or $^{\wp}$ prosody; where the forms are with non-finite [-e] or imperative future [-o] stem syllable two is characterized by y prosody everywhere else it is characterized by $^{\wp}$ prosody. Forms with [-che] have g prosodic junction. All three V units ι, ∈ and α are stated for the stem syllable one. In the forms with non-finite [-e] and imperative future [-o] each of ι, and ∈ units in the stem syllable one is in y and w prosody. α is in $^{\wp}$ prosody. Everywhere else ι is in y prosodic and ∈ is in w prosodic and α is in y, w and $^{\wp}$ prosodic syllables.

9.4.8 $\underline{V\widehat{C}C\text{ə}-}^{w/\wp}$ [1]

	[-i]	[-o]	[-e]	[-e]	[-o]	[-che]	[-te]
1.	$^{\wp}\ \alpha\widehat{C}C\text{ə}-\ ^{\wp}$	$\alpha\widehat{C}C\text{ə}-^{-y-}$	$^{\wp}\ \alpha\widehat{C}C\text{ə}-^{-y-}$	$^{\wp}\ \alpha\widehat{C}C\text{ə}-\ ^{\wp}$	$^{\wp}\ \alpha\widehat{C}C\text{ə}-\ ^{\wp}$	$^{\wp}\ \alpha\widehat{C}C\text{ə}-\ ^{\wp g}$	$\alpha\widehat{C}C\text{ə}-^{\wp}$
2.	$^{w}\ \iota\widehat{C}C\text{ə}-\ ^{\wp}$	$^{w}\ \iota\widehat{C}C\text{ə}-^{-y-}$	$^{w}\ \iota\widehat{C}C\text{ə}-^{-y-}$	$^{w}\ \iota\widehat{C}C\text{ə}-\ ^{\wp}$	$^{w}\ \iota\widehat{C}C\text{ə}-\ ^{\wp}$	$^{w}\ \iota\widehat{C}C\text{ə}-\ ^{\wp g}$	$^{w}\ \iota\widehat{C}C\text{ə}-\ ^{\wp}$

1. See VIII table on page 282

1. [aʈkai] [aʈkie] [aʈkio] [aʈkae] [aʈkao] [aʈkacche][aʈkate]
2. [utrai] [utrie] [utrio] [utrae] [utrao] [utracche][utrate]

The stem syllable one is characterized by ɔ or w prosody. Forms in this structure do not include all three V elements. They only include ʊ in w syllable and ɑ in ɔ syllable. Imperative forms with [-o] (future) and non-finite forms with [-e] do not show any difference in the qualities ~~than~~ from those in the forms with other endings. In all other respects these forms are similar to forms in CV͡CCə- structure.

As forms of reduplicated stem structure CVC/CVCə- do not show peculiarities other than those mentioned in connection with the forms of CVCə- structure they are not exemplified.

CHAPTER 10

VOWEL HARMONY

10.0 General Outline

10.1 CVC- Stem structure

10.2 VC- Stem structure

10.3 CV- Stem structure

10.4 CVCə- Stem structure

10.5 CVə- stem structure

10.6 CVC͡Cə- stem structure

VOWEL HARMONY

10.0

'Vowel harmony' has been defined by Bengali grammarians including S.K.Chatterji as 'the alteration of a vowel through the influence of a preceding or following vowel'.[1] It will be made clear in the course of this discussion that vowel harmony can not be treated purely on the basis of phonetic sequences and that a vowel is not 'changed' 'through the influence' of another vowel.

It has been observed that a phonological approach to the problem would be more appropriate. M.A.Hai in his thesis,[2] brought out some of the interrelations in the phonetic sequences in terms of phonology. But none, so far has tried to deal with this relation of vowel sequences in terms of vowel harmony at the phonological level which in its turn is related to grammatical statement.

The interrelation of stem and ending involves considering the grammatical implications. An attempt to neglect the grammatical and structural implications and to make an overall statement based only on phonetic evidence and segmental contrasts may lead to an over simplified and uneconomic statement[3] which may not be able to bring out the full functional

1. S.K.Chatterji, Marlborough's Bengali Self-Taught, 1927,p.112
2. See M.A.Hai, Nasals and Nasalization in Bengali, Dacca University, 1961.
3. See F.R.Palmer, "The Broken Plurals of Tigrinya" B.S.O.A.S. XVII, 3, p.549.

relevance[1] of the phonological features of vowel harmony.

Since the phonological and grammatical facts of a language show a kind of interdependence, to treat phonology without reference to grammar will result in a concealment of part of a most important set of structural facts pertinent to phonology.[2]

In this section a systematic investigation into the problem of vowel harmony in the Bengali verbal forms is made and a solution in terms of prosodic analysis is suggested.

There are certain verbal forms in Bengali which from a number of points of view are listed as members of the scatter of a single verb. Within this scatter not only do endings differ but there are certain differences to be noted in the phonetic forms of the stem. At the phonological level the structure of the stem does not change in the sense that it remains CVC- or CV- etc., but notable phonetic differences within the limits of the structures are apparent.

A closer examination will show that this diversity of stem forms can be brought into some sort of order if the inter-relation between stem vowel and ending vowel is systematized

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1. See A. Martinet, 'Phonology as functional Phonetics', Oxford University Press, London, 1949, pp.1-27.
2. See K.L.Pike, 'Grammatical Pre-requisites to Phonomic Analysis,' Word, Vol.III, 1947, pp.155-172.
   This does not mean, however, that grammar is pre-requisit to phonology. No level of analysis is pre-requisit to any other; each is interdependent of but congruent with others, and in analysing the language the finding at one level are of assistance in making statements at another level. - See J.R.Firth, 'Technique of Semantics, Papers in Linguistics, (1934-1951), pp.7-33.

in terms of vowel harmony. The implication of such a term is that the vowel elements have some inter-dependence, which will be described and formulated. The vowel of the stem syllable shows a 'harmony' in quality with different endings. That is to say, in certain forms the two vowels of the two syllables are interdependent and interrelated. This regular dependence of vowels of one syllable on that of the other in the verbal forms is treated in terms of vowel harmony.[1] Vowel harmony will be stated in terms of closeness and openness which are associated with each other. It is not, however, possible to describe all the phenomena in one system. A number of varieties are found which lead to the necessity for a polystemic statement.[2]

The examples are chosen to show the salient feature of related vowel harmony. Different sorts of relation will be illustrated by using examples of one word verbal sentences.

The data considered here are entirely drawn from the verbal forms. For clarity and consistency the terms vowel and consonant are used throughout as phonetic terms. In phonological statement V and C are used.

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1. See for some of the notable prosodic studies in vowel harmony in various languages:
   (i) F.R.Palmer, "Openness in Tigre": A Problem in Prosodic Statement, B.S.O.A.S. XVIII, 3, 1956, p.561 ff.
   (ii) J.Carnochan, 'Vowel harmony in Igbo', African Language studies, I, 1960. p.156 ff.
   (iii) R.K.Sprigg, 'Vowel harmony in Lhasa Tibetan: Prosodic analysis applied to interrelated vocalic features of successive syllables.' B.S.O.A.S. XXIV, I,1961.p.147 ff.
2. See J.R.Firth, 'Personality and Language in Society', Papers in Linguistics, 1934-1951. Oxford University Press, London, 1958, pp.177-189.

Much of what I shall say is at one or other of the levels, grammatical, phonological or phonetic. For, 'it is by means of the silent and unpronounceable abstractions of phonology that one can relate the ever changing phonetic detail of the speech stream to the grammatical statement.'[1]

Elements of structure established at the phonological level are of two kinds, phonematic and prosodic. Phonological analysis recognises three V units, ɪ close unit, ɛ mid unit and ɑ open unit. Backness and rounding, frontness and unrounding, or absence of backness and frontness and lip rounding of the vowel sound in pronunciation are considered together with the rounding or unrounding of the consonant articulation, where there is one, and stated phonologically as a prosody of the syllable, and symbolized as ^{w}, ^{y}, or ^{o}.

Vowel harmony will be treated under sections:

(i) monosyllabic stem structures: CVC-, ~~and~~ VC- and CV-

and (ii) Dissyllabic stem structures: (C)VCə-[2],
CVə-, (C)V$\widehat{C}$Cə-[2]

Examples are chosen to cover the full range of vowel sequences possible in forms of all stem structures plus endings of all possible structures: -V, -CV, -CVC, -əCV, and -əC. The forms used for examples are with the following endings:

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1. See B.J.Carnochan, Vowel harmony in Igbo, African Language Studies, I, 1960, p.156 ff.
2. Since the forms in structures VCə- and V$\widehat{C}$Cə- show similar vowel harmony respectively to those in CVCə- and CV$\widehat{C}$Cə- structures they are not examplified in order to avoid repetition. For the same reason forms in reduplicated stem structures are also not given.

For the indicative forms:

-V ; [-i] , [-e] , [-o]

-CV : [-li] , [-le] , [-lo].[1]

-CVC : [-lam].

-əCV : [-eche].

For the imperative forms:

-V : [-o] , [-o].

-əC : [-iʃ] , [-uk].

∅ :

For the non-finite forms:

-V : [-e] , [-a].[2]

-CV : [-le] , [-te] , [-no].[2]

-VC : [-on].

As regards vowel harmony, it can be said that Bengali verbal forms do not show any peculiarities other than those mentioned here. Any Bengali verbal form can be fitted into one of the patterns.

10.1 Monosyllabic Stem-structure : CVC -

The verbal forms used for example in CVC- stem structure belong to the following stems piṭ- khel- kaṭ- bɔl- and tol-.

In considering the phonetic characteristics of the

1. Endings [-chi], [-che], [-cho] [-bi] [-be] and [-bo] are included for the examples in CV- stem structures. See § 10.3
2. [-a] is used with the forms of the stem structures CVC-, VC- and CV-; [-no] is used with the forms of the stem structures CVCə-, VCə-, CVə-, CVCCə-, VCCə and CVC/CVCə-. See § 10.1 - 10-6.

vowels observed in the different scatters set out below it will be seen that a total of seven vowels must be recognised at the phonetic level. But in no single set of forms, (read vertically) is the maximum of five different vowels exceeded, sometimes they are less. The phonetic values assigned to these vowels are described in Chapter 5.

Front	Central	Back
[i]		[u]
[e]		[o]
[æ]		[ɔ]
	[a]	

The following are the forms of structure CVC- with endings of different structures. Read horizontally the different forms on the same line of each list belong to the scatter of one same verb.

(a) Indicative forms

(i) CVC + V

	[-i] ending-		1 [-e] ending.		2 [-o] ending	
1.	[i] -[i]	[piṭi]	[-e] - [e]	[peṭe]	[e]-[o]	[peṭo]
2.	[e]- [i]	[kheli]	[æ]- [e]	[khæle]	[æ]-[o]	[khælo]
3.	[a]- [i]	[kaṭi]	[a]- [e]	[kaṭe]	[a]-[o]	[kaṭo]
4.	[o]- [i]	[boli]	[ɔ]- [e]	[bɔle]	[ɔ]-[o]	[bɔlo]
5.	[u]- [i]	[tuli]	[o]- [e]	[tole]	[o]-[o]	[tolo]

1. M.A.Hai has two alternative pronunciations as [piṭe] and [chuṭe] in this group, which I treat under the non-finite forms in [-e] ending. M.A.Hai, op.cit., pp. 54 ff.
2. M.A.Hai's 'Alternative realizations [piṭo] and [chuṭo] belong to the imperative future forms in [-o] ending in this study. M.A.Hai, op.cit. 48 ff.

Forms with ending [-iʃ] show vowel sequences similar to those with ending [-i]; forms with ending [-en] are similar to those in [-e]; forms with [-on] are similar to those in [-o].

(ii) CVC + CV

[-li] ending		[-le] ending		[-lo] ending	
1. [i]-[i]	[piṭli]	[i]-[e]	[piṭle]	[i]-[o]	[piṭlo]
2. [e]-[i]	[khelli]	[e]-[e]	[khelle]	[e]-[o]	[khello]
3. [a]-[i]	[kaṭli]	[a]-[e]	[kaṭle]	[a]-[o]	[kaṭlo]
4. [o]-[i]	[bolli]	[o]-[e]	[bolle]	[o]-[o]	[bollo]
5. [u]-[i]	[tulli]	[u]-[e]	[tulle]	[u]-[o]	[tullo]

Forms in endings [-chi], [-chiʃ], [-chili], [-chile], [-chilo], [-chilen], [-chilam] [-tiʃ], [-bi] show vowel sequences similar to those in [-li].

Forms with endings [-che], [-chen], [-te], [-ten], [-be], [-ben], [-len] are similar to those in [-le].

Forms with endings [-cho], [-to], [-bo] are similar to those in [-lo].

(iii) CVC + CVC [-lam] ending [1]	(iv) CVC + eCV [-eche] ending
1. [e]-[a] [peʈlam] [2]	[i]-[e] [piʈeche]
2. [ɷ]-[a] [khællam]	[e]-[e] [kheleche]
3. [a]-[a] [kaʈlam]	[e]-[e] [keʈeche]
4. [ɔ]-[a] [bɔllam]	[o]-[e] [boleche]
5. [o]-[a] [tollam]	[u]-[e] [tuleche]

Forms with [-tam] are similar to those with [-lam] ; forms with [-echi] [-echiʃ], [-echo] [-echen] [-echilam] [-echili] [echile] [echilo] [echilen] are similar to those with [-eche].

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1. There are a few verbal scatters which show alternative forms for some speakers. e.g. bec- and kuʈ- and chuʈ-with [-lam] ending have the forms [beclam] and [bæclam]; [kuʈlam] and [koʈlam] [chuʈlam] and [choʈlam]. The alternative forms such as [beclam] and [kuʈlam] and [chuʈlam] are not included with the examples.

   In all other respects forms of the scatters are similar to the verbs of khel- and tol- cited here.

2. The form has an alternative pronunciation [piʈlam]

(c) Imperative forms

(i) CVC + ∅ [1]	(ii) CVC + əC	
	(-iʃ] ending	[-uk] ending
1. [peʈ] [2]	[i]-[i] [piʈiʃ]	[i] -[u][piʈuk]
2. [khœl]	[e]-[i] [kheliʃ]	[e] -[u] [kheluk]
3. [kaʈ]	[a]-[i] [kaʈiʃ]	[a] -[u] [kaʈuk]
4. [bɔl]	[o]-[i] [boliʃ]	[o] -[u] [boluk]
5. [tol]	[u]-[i] [tuliʃ]	[u] -[u] [tuluk]

Forms with [-un] are similar to those with [-uk].

(iii) CVC + V [3]

	[-o] ending (Present)		[o-] ending (future)	
1.	[e]-[o]	[peʈo]	[i]-[o]	[piʈo]
2.	[œ]-[o]	[khœlo]	[e]-[o]	[khelo]
3.	[a]-[o]	[kaʈo]	[e]-[o]	[keʈo]
4.	[ɔ]-[o]	[bɔlo]	[o]-[o]	[bolo]
5.	[o]-[o]	[tolo]	[u]-[o]	[tulo]

It will be seen that the present imperative forms with [-o] are similar to the indicative with [-o]. [4] (supra)

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1. Although these forms in ∅ ending are monosyllabic and thus display no vowel harmony relation as between the two syllables of the forms in other endings, they show same five vowel differences of [e], [œ], [a], [ɔ] and [o], in the stem syllable and are therefore included in the examples.
2. The alternative pronunciation of this form is [piʈ]
3. Imperative forms are found in present and future tenses. Forms in both tenses are found in [-o] ending. But the stem syllable shows different features in different 'tense-endings' For the present purpose the two groups will be separated by naming them as 'present' and 'future'.
4. See Chapter 1.

(C) Non-finite forms

(i) CVC + V

	[-e] ending		[-a] ending	
1.	[i]-[e]	[piṭe]	[e]-[a]	[peṭa][1]
2.	[e]-[e]	[khele]	[æ]-[a]	[khæla]
3.	[e]-[e]	[keṭe]	[a]-[a]	[kaṭa]
4.	[o]-[e]	[bole]	[ɔ]-[a]	[bɔla]
5.	[u]-[e]	[tule]	[o]-[a]	[tola]

(ii) CVC + CV[2]

	[-le] ending		[-te] ending	
1.	[i]-[e]	[piṭle]	[i]-[e]	[piṭte]
2.	[e]-[e]	[khelle]	[e]-[e]	[khelte]
3.	[a]-[e]	[kaṭle]	[a]-[e]	[kaṭte]
4.	[o]-[e]	[bolle]	[o]-[e]	[bolte]
5.	[u]-[e]	[tulle]	[u]-[e]	[tulte]

It will be seen that the indicative forms in endings [-le] and [-te] are similar to the non-finite forms in [-le] and [-te].[2]

(iii) CVC + VC

	[-on] ending	
1.	[e]-[o]	[peṭon][3]
2.	[æ]-[o]	[khælon]
3.	[a]-[o]	[kaṭon]
4.	[ɔ]-[o]	[bɔlon]
5.	[o]-[o]	[tolon]

1. The alternative form of [peṭa] is [piṭa]
2. See § 3.4.5 and 3.4.6
3. The alternative form of [peṭon] is [piṭon].

When the patterns of stem + ending vowels are examined, it is seen that there is no contrast relationship of frontness or backness with backness throughout a form. That is, no prosodic interrelation of rounded-rounded or unrounded-unrounded can be stated between the ending syllable and the stem syllable in terms of ^{y}, ^{w}, or ^{o}.[1] For example, in [peṭo] the stem syllable is ^{y} prosodic and the ending syllable is ^{w} prosodic. In [tuli] the stem syllable is ^{w} prosodic and ending syllable is ^{y} prosodic. In [kaṭi] and [kaṭo] the stem syllable is ^{o} prosodic and the ending syllable is ^{y} and ^{w} prosodic respectively.

It will also be seen from the examples that every verbal scatter shows forms with a closer vowel and with a more open vowel in the stem though the vowel in the ending is the same. For instance, in the scatter of the verb [bɔle], [bole], [bɔlo] [bolo] the sequences are [ɔ-e], [o-e], [$\overset{\circ}{e}$-o] and [o-o].

A twofold relationship, close-close, and open-open can be stated for the two syllables of the stem and ending of some of the verbal forms. That is, an interrelation is statable in terms of degree of closeness and openness between the two syllables: where the vowel of the ending is close rather than open there is closeness in the stem, and where the vowel of the ending is open rather than close there is openness in the vowel of the stem syllable. For example, forms in [i] ending and [a] ending may be compared : [piṭi], [kheli], [kaṭi], [boli], [tuli]; [peṭa] [khæla], [kaṭa], [bɔla], [tola]. But

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1. See for phonetic implications of y, w and ^{o} prosodics Chapter 7.

this statement can not be given as a rule for some other verbal forms, for instance non-finite and indicative forms in [-e] ending , indicative and imperative forms in [-o] ending. e.g. [peṭe], [khæle], [kaṭe], [bɔle], [tole] (indicative); [piṭe], [khele], [keṭe] [bole] and [tule] (non-finite); [peṭo], [khelo], [kaṭo], [bɔlo] and [tolo] (indicative); and [piṭo], [khelo], [keṭo], [bolo], and [tulo] (Imperative future).

It seems, therefore, clear that an overall vowel harmony statement can not properly be made solely on the basis of phonetic sequences. Interrelations between ending syllables and stem syllables can be shown as a set of systems in which phonetic, phonological and grammatical consideration will play a part.[1]

(a) Indicative forms:

Forms whose ending structure is -V

In the forms where the ending is [i], five vowels are possible in the stem syllable: [i], [e], [a], [o], [u].

In the forms where the ending is [e] and [o], five vowels are possible in the stem syllable [e], [æ], [a], [ɔ], and [o].

1. Supra.

In other words the interrelation is concerned with (a) close forms and (b) open forms.[1]

With the close vowel [i] in the ending, forms of different scatters exhibit [i], [e], [a], [o] and [u] in the stem syllable, and with the half-close vowel [-e] or [o] in the ending they exhibit [e], [ɐ], [a], [ɔ], and [o]. That is, where the vowel of the ending is close there is closeness in the stem, and where the vowel of the ending is half-close there is openness in the stem.

The forms in [-i] ending that exhibit closeness in the stem syllable will be referred to as close forms and the forms in [-e] and [-o] endings that exhibit openness in the stem syllable will be referred to as open forms.

In close forms where the second syllable is close in y-prosody, the first syllable is close mid and open in all three prosodies, y, w, ɒ

In each of y and w prosodic syllable the vowel in the stem has two qualities between close and half-close, and between half-close and half-open and in ɒ - prosodic syllable the vowel in the stem syllable is open neither front nor back.

The vowel qualities in y- and w- syllables are never more open than between half-close and half-open. That is, the maximum

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1. These are prosodic terms and are employed for the statement of the forms as a whole in terms of vowel harmony. J.Carnochan uses the term 'raising' and 'lowering' for his treatment (see his vowel harmony in Igbo', African language studies, I, 1960. p.156.); R.K.Sprigg uses 'open piece' and 'close piece' (see his vowel harmony in Lhasa Tibetan: B.S.O.A.S. XXIV, I, 1961).

degree of openness in y- and w- syllable in close forms is between half-close and half-open.

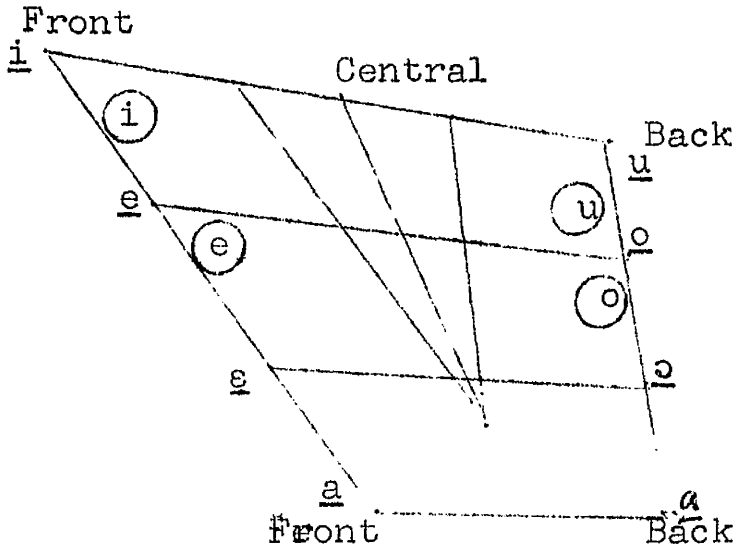
In open forms where the vowel of the second syllable is mid in y- or w- prosody, the first syllable is mid and open in all three prosodics, y, w, and ɒ

In each of y and w prosodic syllable the vowel in the stem syllable has two qualities between half-close and half-open and between half-open and open, and in ɒ - prosodic syllable the vowel in the stem syllable is open neither front nor back.

The vowel qualities in y- and w- syllables are never closer than between half-close and half-open. That is, the maximum degree of closeness in y- and w- syllable in open forms is half-close.

The vowel qualities are shown in the following vowel diagrams.

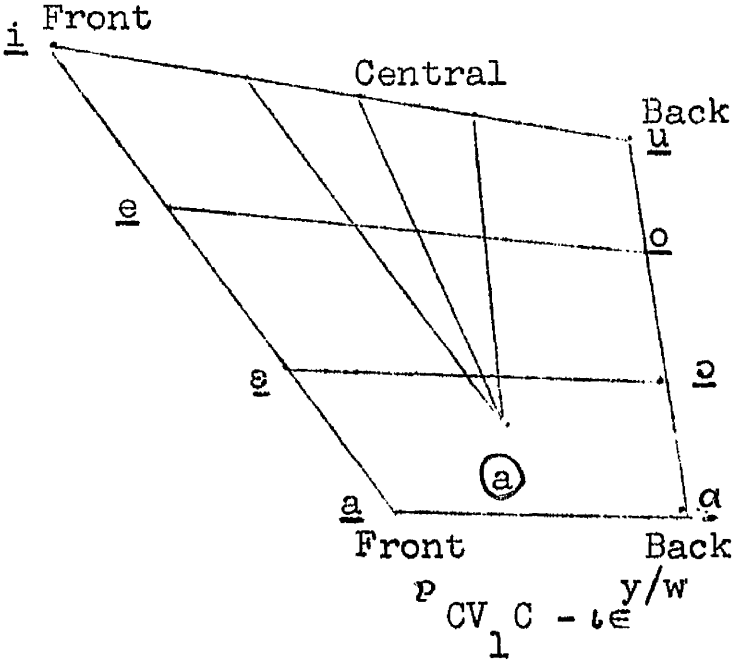
I Close forms



y/w CV_2C - ɪ y

II

Both close and open forms



$^{p}CV_1C - \iota\in^{y/w}$

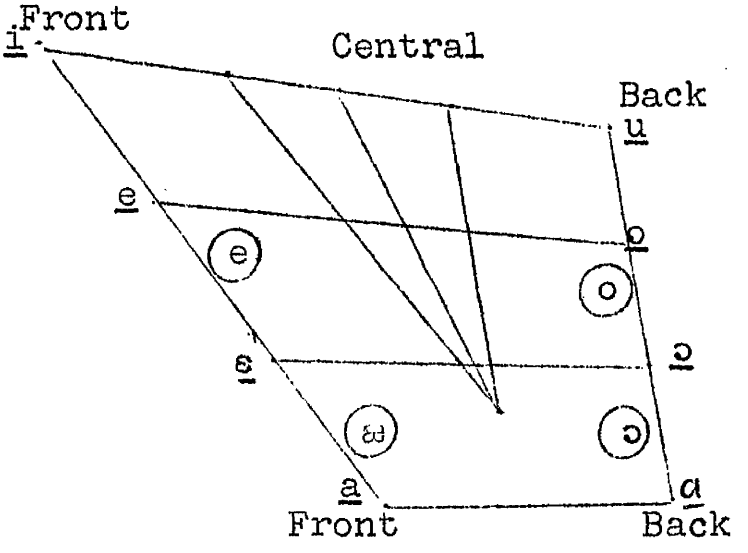
[kaṭi]

[kaṭe]

[kaṭo]

III

Open forms



$^{y/w}CV_2C - \in^{y/w}$

[peṭe] [toɸle]

[khæle] [bɔle]

[peṭo] [tolo]

[khælo] [bɔlo]

It will be seen that except for some alternative forms, 'close-forms' have maximum degree of openness between half-close and half-open, and 'open forms' have maximum degree of closeness between half-close and half-open, vowel qualities in the stem syllable both in ^{y} and ^{w} prosodies.

CVC+CV

It will be seen from the examples, that in the forms of the scatters in endings [-li], [-le], and [-lo] five vowels : [i], [e], [a], [o], and [u] are possible in the stem syllable. That is, these forms exhibit same phonetic characteristic as in the forms in [i] ending. These forms, therefore, are treated as close forms. This statement will hold good for all the forms of the scatter whose ending structure is -CV.

In each of ^{y} and ^{w} prosodic syllable the vowel in the stem syllable has two qualities, close and half-close, and in o prosodic syllable the vowel in the stem syllable is open neither front nor back.

The maximum degree of openness in ^{y} and ^{w} prosodic syllables is between half-close and half-open.

That is, where the ending is of -CV structure the forms have only one sort of vowel harmony relation. No change in the vowel of the stem is observed in the forms with different vowels in the ending structure -CV. The vowel in the stem-

syllable does not alter whether the vowel in the ending syllable is close front, half-close front, or half-close back.

Qualities of vowels in ^{y} and ^{w} prosodic syllable in the forms of CVC + CV ending structure are similar to those in [i] ending-forms.

CVC + CVC

A different statement is required for the forms in [-lam] ending. The forms in [-lam] ending show five different vowels in the stem syllable: [e], [œ], [a], [ɔ], and [o].

In ^{y} and ^{w} syllables the vowel in the stem syllable have two qualities, between half-close and half-open and between half-open and open, in $^{\circ}$ syllable the vowel in the stem syllable has one quality, i.e. open neither back nor front.

The maximum degree of closeness in ^{y} and ^{w} syllables is between half-close and half-open. The forms in this ending, therefore, will be referred to as open forms.

The vowel qualities in different syllables are similar to those shown in vowel diagram II and III for the open forms in [e] and [o] endings.[1]

It will be seen that the 'open forms' in [-e] or [o] ending are in the same system as the open form in [-lam] ending; and that the 'close forms' in [-i] ending are in the same system as the close form in [-li], [-le] and [-lo] endings.

This shows that the forms in ending whose structure is -CV and -CVC form two groups, close forms and open forms in terms of vowel harmony in the same system as those whose

1. Supra

ending structure is -V, with the difference that in close forms whose ending structure is -V, it has [i] in the second syllable, and in close forms whose ending structure is -CV, it has [i], [e] and [o] in the second syllable; and that in open forms whose ending structure is -V, it has [e] or [o] in the second syllable, and in open forms whose ending structure is -CVC, it has [a] in the second syllable.

That is to say a relation between the two syllables of the forms whose structures are CVC-CV, or CVC-CVC can be stated that where a -C-C- sequence of stem and ending occurs the form is either close or open. The open forms have invariably the ending structure -CVC, the close forms have -CV and -CVC both. But the vowel in the ending syllable of the open form is always [a] in the open forms, and [-i], [e] or [o] in the close forms.

CVC + əCV

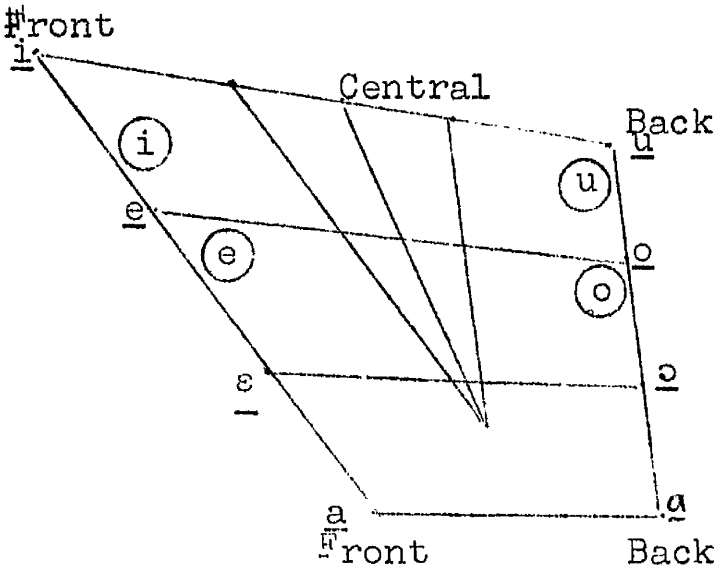
In the forms where the ending is [-eche] four vowels are possible in the stem syllable : [i], [e], [o] [u].

Thus in each of ^{y} and ^{w} prosodic syllable the vowel in the stem syllable has two qualities, close and half-close. The most important point to be noted is that there is no ^{o} prosodic syllable in the form of the scatter where the vowel of the stem syllable is open neither front nor back in other endings, both in 'close forms' and 'open forms.'

The vowel qualities in ^{y} and ^{w} syllables are never more open than between half-close and half-open. This is the maximum

degree of openness even for the verb of the scatter where open syllable in ɔ prosod y of the close forms in [-i] ending is stated. Thus, [kaṭi] has maximum openness in the stem syllable, whereas in [-eche] ending the scatter gives the form [keṭeche], where the maximum openness of the vowel of the stem syllable is between half-close and half-open. That is to say, in close forms where four vowel differences are found there are two degrees of openness in each of ^{y} and ^{w} syllables where the maximum degree of openness is between half-close and half-open.

The vowel qualities of these forms are shown in the diagram below: with reference to my pronunciation of the forms [piṭe], [khele], [keṭe], [bole], [tule].



(b) Imperative forms

In the forms where the ending is ∅ or [-o] (Present) five vowels [e], [ɐ], [a], [ɔ], and [o] are possible in the stem-syllable.

It will be noted that the monosyllabic forms in ∅ ending show the same five vowel differences in the stem syllable as the forms in ending [-o] (Present). Hence they are included in the examples, though there can be no vowel harmony statement for these forms.

In the forms where the ending is [-iʃ] or [-uk] five vowel differences are possible: [i], [e], [a], [o], [u].

In the forms where the ending is [-o] (Future) four vowels: [i], [e], [o] and [u] are possible in the stem syllable.

The forms in [-iʃ] and [-uk] endings exhibit closeness in the stem syllable and will be referred to as 'close forms', and the forms in endings ∅ and [-o](Present) exhibit openness in the stem syllable and may be referred to as 'open forms'.

In close forms where the second syllable is close in y or w- prosody, the first syllable is close, mid and open in all three prosodies, y, w and ɔ

In each of y and w- prosodic syllable the vowel in the stem syllable has two qualities, between close and half-close, and between half-close and half-open, and in ɔ prosodic syllable the vowel in the stem syllable is open neither back nor front.

The vowel qualities are never opener than between half-

close and half-open in y and w syllables.

In open forms where the second syllable is mid in w prosody, the first syllable is mid and open in all three prosodies, y, w and ɔ

In each of y and w prosodic syllables the vowel in the stem syllable has two qualities, between half-close and half-open, and between half-open and open, and in ɔ prosodic syllable the vowel in the stem syllable has an open quality neither front nor back.

Imperative open forms show same vowel harmony relation as indicative open forms whose ending structure is -V; and imperative close forms show same vowel harmony relation as indicative close-forms whose ending structure is -V.

In the forms where the ending is [-o] (Future) four vowels [i], [e], [o] and [u] are possible. These are close forms where the second syllable is mid in w prosody the first syllable is close and mid in y and w prosodies. There is no form exhibiting a ɔ -prosodic stem syllable.

The vowel qualities in y and w syllables are never more open than between half-close and half-open. This is the maximum degree of openness even for the most open syllable in ɔ -prosodic syllable of a close form in ending [-iʃ] or [-uk]. Thus, [kaʈiʃ] or [kaʈuk] has maximum openness in the stem syllable, whereas in [keʈo], maximum openness is between half-close and half-open. That is to say, where four vowel alternances are found in close forms. There are two degrees of openness in each of y and w syllables where the maximum degree

of openness is halfway between half-close and half-open.

It is interesting to note that the imperative forms in ending [-o] (Future) show similar feature as the indicative forms in [-eche] ending.

(c) Non-finite forms:

In the non-finite forms where the ending is [-e] four vowels [i], [e], [o] and [u] are possible in the stem syllable.

In the forms where the ending is [-a] or [-on] five vowels [e], [æ], [a], [ɔ] and [o] are possible:

The forms ending [-e] exhibit closeness in the stem syllable, and will be referred to as close forms. The forms in endings [-a] and [-on] exhibit openness in the stem syllable and will be referred to as open forms.

In close forms where the vowel of the second syllable in y prosody is half-close, the first syllable in y and w prosodies is close and mid. The scatters have no forms exhibiting a ɔ prosodic stem-syllable.

The vowel qualities in y and w syllables are never more open than between half-close and half-open. This is the maximum degree of openness even for the syllable in the form [keṭe] of the scatter kaṭ-. These non-finite forms in [-e] ending may be compared with the imperative forms in [o](Future) ending and indicative forms in [-che]ending. All these forms are close forms exhibiting four vowel alternances in the stem syllable. They may be contrasted with the indicative forms in [e] ending, where the forms are open form.

In these close forms vowels are found in two degrees of closeness in each of y and w syllables where the maximum

degree of openness is half-close.

The open forms whose ending structure is -V or -əC where the V is open in ɔ prosody and ə of -əC is in w prosody the vowel of the first syllable in y or w prosody has two qualities: between half-close and half-open and between half-open and open and in ɔ prosodic syllable the vowel is open neither front nor back. The maximum degree of closeness in y and w syllables is between half-close and half-open in these open forms.

The non-finite forms in [-le] and [-te] endings show five vowel differences in the stem syllable : [i], [e], [a], [o] and [u]. These forms show exactly the same phonetic alternances as those in indicative [-le] ending. These are stated as close forms. A separate statement is not required for the non-finite close-forms of this category, as the statement made for the indicative close forms whose ending structure is -CV holds good for these.

The above statement can be summarised as follows:

Vowel harmony cannot be stated purely on the basis of phonetic succession, but an interrelation between the second syllable and the first syllable can be shown. The inter:-relation of the system is concerned with

(a) the close formsof verb, and

(b) the open forms of verb.

In both close forms and open forms there are two degrees of openness in each of y and w syllables, and one degree in ɔ syllable.

In close forms the degree of openness is never more open than between half-close and half-open, and in open forms degree of closeness is never closer than between half-close and half-open in both y and w syllables.

Close forms form two categories: (i) those exhibiting five vowels, [i], [e], [a], [o], and [u] in the stem-syllable; and (ii) those exhibiting four vowels [i], [e], [o] and [u] in the stem syllable.

Open forms exhibit five vowels, [e], [æ], [a], [ɔ] and [o] in the stem syllable.

It will be seen that the vowel [a] falls in one category of close formsand in open forms. One category of close forms does not show [a] in the stem syllable.

Each of indicative, imperative and non-finite forms is either an open form or a close form of either kind.

Indicative close forms whose ending structure is -V show five vowel alternances in the stem syllable where V in ending syllable is close unit in y prosody. The stem syllable has two degrees of openness in y and w prosodies, and one degree of openness in ʊ - prosody.

Indicative open forms whose ending structure is -V show five vowel alternances in ths stem syllable where the ending is mid in y and w syllable. The stem syllable has two degrees of openness in y and w prosodies and one degree of openness in ʊ- prosody.[1]

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1. In alternative forms [piṭe] and [chuṭe] the vowel quality is close in both y and w syllables.

Indicative forms whose ending structure is -əCV are always close forms. They show four vowel alternances in the stem syllable where the ending initial syllable is ə in y prosody. The stem syllable has two degrees of openness in y and w prosodies. There is no ɒ - prosodic syllable in the stem in the forms with this ending structure.

Indicative close forms whose ending structure is -CV(C) show five different vowel alternances in the stem syllable where the second syllable is close in y prosody or mid in y or w prosody. The stem syllable has two degrees of openness in y and w prosodies and one degree of openness in ɒ prosody.

Indicative open forms whose ending structures is -CV(C) show five different vowel alternances in the stem syllable where the second syllable is open in ɔ prosody. The stem syllable has two degrees of openness in y and w prosodies, and openness in ɔ prosody.

These can be formulated thus:

Indicative forms

CVC- stem structure + V ending structure

	First syllable	Second syllable	
Close forms[1]	[i],[e],[a],[o],[u].	[i]	close: $\frac{y/w \quad y}{CV_2C-\iota}$; close: $\frac{ɔ \quad y}{CV_1C-\iota}$
Open forms[2]	[e],[æ],[a],[ɔ],[o]	[e]/[o]	open: $\frac{y/w \quad y/w}{CV_2C-\epsilon}$; open: $\frac{ɔ \quad y/w}{CV_1C-\epsilon}$

CVC+əCV

Close forms[3]	[i],[e], [a], [u],	[e]	close: $\frac{y/w \quad y}{CV_2C-əCV}$

CVC CV(C)

close forms[4]	[i], [e],[a],[o],[u]	[i]/[e]/[o]

close: $\frac{y/w \quad y/ \quad y/w}{CV_2C - C_\iota // C\epsilon}$

close: $\frac{ɔ \quad y/ \quad y/w}{CV_1C - C_\iota / C\epsilon}$

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1. See Indicative forms with ending [-i] on page 303.
2. See Indiactive forms with ending [-e] and [-o] on page 303.
3. See Indiactive forms with ending [-eche] on page 305.
4. See Indiactaive forms with ending [-le] on page 304 and also for [-li], [-lo].

open forms[1] [e], [æ],[a],[ɔ],[o] [a] $\frac{\text{open}}{\text{y/w}\quad \text{CV}_2\text{C-C}\alpha\text{C}}\quad \frac{\text{open}}{\text{ɔ}\quad \text{CV}_1\text{C-C}\alpha\text{C}}$ ɔ

Imperative close forms whose ending structure is V show four vowel alternances in the stem syllable where the ending syllable is mid in w prosody. The stem syllable has two degrees of openness in y and w prosodies. There is no ɔ prosodic syllable in the stem of the forms with this ending structure.

Imperative open forms whose ending structure is V, show five vowel alternances in the stem syllable where the ending syllable is mid in w prosody. The stem syllable has two degrees of openness in y and w prosodies, and one degree of openness in ɔ - prosody.[2]

The imperative close forms are in future tense and the imperative open forms are in present tense.

Imperative forms whose ending structure is -əC are all close forms. They show five vowel alternances in the stem syllable where the ending syllable is ə in y and w prosodies. The stem syllable has two degrees of openness in y and w prosodies and one degree of openness in ɔ prosody.

These can be formulated thus:

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1. See Indicative forms with ending [-laṁ] on page 305.
2. The alternative forms [piṭo] and [chuṭo] are considered in future imperative close forms in [-o] ending.

Imperative forms

CVC + V :	First syllable	Second syllable	
close forms:[1]	[i],[e],[o],[u]	[o]	close: $CV_2C-\in$ (y/w, w)
open forms :[2]	[i],[e],[a],[ɔ],[o]	[o]	open: $CV_2C-\in$ (y/w, w)
			open: $CV_1C-\in$ (ɔ, w)
CVC +əC :			
close forms:[3]	[i], [e],[a],[o],[u],	[i]/[u]	close: $CV_2C-əC$ (y/w, y/w)
			close: $CV_1C-əC$ (ɔ, y/w)

Non-finite close forms whose ending structure is V, show four vowel alternances in the stem syllable where the ending syllable is mid in y prosody. The stem syllable has two degrees of openness in y and w prosodies. There is no ɔ prosodic syllable in the stem of the forms with this ending structure.

Non-finite open forms whose ending structure is V, show five vowel differences in the stem syllable where the ending

1. See Future Imperative forms with ending [-o] on page 306.
2. See Present Imperative forms with ending [-o] on page 306.
3. See Imperative forms with endings [-iʃ] and [-uk] on page 306.

syllable is open in ɔ prosody. The stem syllable has two degrees of openness in y and w prosodies and one in ɔ prosody.[1]

Non-finite open forms whose ending structure is-əC, show five vowel alternances in the stem syllable where the ending syllable is mid in w prosody. The stem syllable has two degrees of openness in y and w prosodies and one degree of openness in ɔ prosody.

Non-finite forms whose ending structure is -CV are all close forms. They show five vowel differences in the stem syllable where the ending syllable is mid in y prosody. The stem syllable has two degrees of openness in y and w prosodies and one degree of openness in ɔ prosody.

These can be formulated thus:

Non-finite forms

CVC + V :	First syllable	Second syllable	
close forms:[2]	[i],[e],[o],[u]	[e]	$\underset{y/w \quad y}{\underline{\text{close}}}$ $CV_2C-\epsilon$
open forms :[3]	[e],[æ],[a],[ɔ],[o]	[a]	$\underset{y/w \quad ɔ}{\underline{\text{open}}}$ $CV_2C-\alpha$
			$\underset{ɔ \quad ɔ}{\underline{\text{open}}}$ $CV_1C-\alpha$

---

1. The alternative forms [piṭa], [chuṭa] and [piṭon] [chuṭon] have close vowel in the stem syllable in both y and w-prosodies.
2. See Non-finite forms with [-e] on page 307.
3. See Non-finite forms with [-a] on page 307.

CVC + əC

open forms:[1] [e],[æ],[a],[ɔ],[o] [o] open CV_2C y/w w -əC

open CV_1C-V_1 ɔ w

CVC + CV

close forms:[2] [i],[e],[a],[o],[u] [e] close $CV_2C-C\in$ y/w y

close $CV_1C-C\in$ ɔ y

This phonetic relation stated in terms of phonology can be related to different grammatical categories with cross reference to the particular ending structures of the close forms and open forms.

Indicative forms in simple present tense, first person are close forms. They exhibit five vowel alternances in the stem syllable, [i], [e], [a], [o] and [u]. Forms in simple present, 3rd person and second person, ordinary grade are open forms exhibiting five vowel alternances [e], [æ], [a], [ɔ], and [o] in the stem syllable of the forms of different scatters. Forms in present and past perfect tenses in all persons and grades are close forms that exhibit four vowels, [i], [e] [o] and [u] in the stem syllable of forms of different scatters.

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1. See Non-finite forms with [-on] on page 307.
2. See Non-finite forms with [-le] and [-te] on page 307.

Forms in simple past and habitual past in 2nd and 3rd persons in all grades, and in future and present progressive and past progressive tenses in all persons and grades, are close forms which exhibit five vowel alternances, [i], [e], [a], [o] and [u] in the stem syllable. Forms in simple past and habitual past in 1st person are open forms that exhibit five vowel alternances [e], [æ], [a] [ɔ] and [o] in the stem syllable of forms of different scatters.

Imperative forms in future tense, 2nd person, ordinary grade are close forms that exhibit four vowel alternances, [i], [e], [o] and [u] in the stem syllable. Forms in present and future tenses, 2nd person honorific and familiar grade, third person ordinary and honorific grade are close forms that show five vowels [i], [e], [a], [o] and [u] in the stem syllable of CVC- structure. Forms in present tense, second person ordinary grade are open forms exhibiting [e], [æ], [a] [ɔ] and [o] in the stem syllable of the verbs of different scatters.

Non-finite forms with ending [-e] are close forms which exhibit four vowel alternances [i], [e], [o] and [u] in the stem syllable. Forms with [-le] and [-te] endings are close forms and they exhibit five vowel alternances, [i], [e], [a] [o], and [u]. Forms with [-a] and [-no] endings are open forms. They exhibit five vowels in the stem syllable of the forms of different scatters, [e], [æ], [a], [ɔ], and [o].

Now I propose to set out in tabulated form the phonological formulae for the stem and ending syllables, together

with some verbal forms whose generalized stem structure is CVC-.

Table of the phonological formulae for the stem and ending syllables of CVC- stem structure.

(a) Indicative forms

	Close forms					Open forms		
	-V	-CV			-əCV	-V		-CVC
	[-i-] end ing	[-li]	[-le]	[-lo]	[-echə]	[-e]	[-o]	[-lam]
	y/w y $CV_2C-\iota$	y/w y $CV_2C-C\iota$	y/w y $CV_2C-C\in$	y/w w $CV_2C-C\in$	y/w y $CV_2C-əC\in$	y/w y $CV_2C-\epsilon$	y/w w $CV_2C-\epsilon$	y/w ɔ CV_2C- $C\alpha C$
1.	close y y $C\iota C-\iota$	close y y $C\iota C-C\iota$	close y y $C\iota C-C\in$	close y w $C\iota C-C\in$	close y -y- y $C\iota C-əC\in$	open y y $C\in C-\epsilon$	open y w $C\in C-\epsilon$	open y ɔ $C\in C-C\alpha C$
2	close y y $C\in C-\iota$	close y y $C\in C-C\iota$	close y y $C\in C-Ce$	close y w $C\in C-C\in$	close y -y-y $C\in C-əC\in$	open y y $C\alpha C-\epsilon$	open y w $C\alpha C-\epsilon$	open y ɔ $C\alpha C-C\alpha C$
4	close w y $C\iota C-\iota$	close w y $C\in C-C\iota$	close w y $C\in C-Ce$	close w w $C\in C-C\in$	close w -y-y $C\in C-əc\in$	open w y $C\alpha C-\epsilon$	open w w $C\alpha C-\epsilon$	open w ɔ $C\alpha C-C\alpha C$
5	close w y $C\iota C-\iota$	close w y $C\iota C-C\iota$	close w y $C\iota C-Ce$	close w w $C\iota C-C\in$	close w -y-yy $C\iota C-əC\in$	open w y $C\in C-\epsilon$	open w w $C\in C-\epsilon$	open w ɔ $C\in C-C\alpha C$
	ɔ y $CV_1C-\iota$	ɔ y $CV_1C-C\iota$	ɔ y CV_1C-Ce	ɔ w $CVC-Ce$	y - y-y $CVC-əC\in$	ɔ y $CVC-\epsilon$	ɔ w $CVC-\epsilon$	ɔ ɔ $CVC-C\alpha C$
3	close ɔ y $C\alpha C-\iota$	close ɔ y $C\alpha C-C\iota$	close ɔ y $C\alpha C-Ce$	close ɔ w $C\alpha C-Ce$	close y -y-y $C\in C-əC\in$	open ɔ y $C\alpha C-\epsilon$	open ɔ w $C\alpha C-\epsilon$	open ɔ ɔ $C\alpha C-C\alpha C$

Scatter							
1.	[piţi]	[piţli]	[piţle]	[piţlo]	[piţeche]	[peţe]	[p
2.	[kheli]	[khelli]	[khelle]	[khello]	[kheleche] [keţeche]	[khæle]	[
4.	[boli]	[bolli]	[bolle]	[bollo]	[bolechi]	[bɔle]	[
5.	[tuli]	[tulli]	[tulle]	[tullo]	[tuleche]	[tole]	[
3.	[kaţi]	[kaţli]	[kaţle]	[kaţlo]	[keţeche]	[kaţe]	[

(c) Imperative forms

	Close forms				Open forms
	-əC			V	V
	[-iʃ] close $y/_{w}\ CV_2C\text{-}əC\ {}^{y}$	[-uk] close $y/_{w}\ CV_2C\text{-}əC\ {}^{w}$	[-un] close $y/_{w}\ CV_2C\text{-}əC\ {}^{w}$	[-o] Future close $y/_{w}\ CV_2C\text{-}\in\ {}^{w}$	[-o] open $y/_{w}\ CV_2C\text{-}\in\ {}^{w}$
1.	close $y\ C\iota C\text{-}əC\ {}^{y}$	close $y\ C\iota C\text{-}əC\ {}^{w}$	close $y\ C\iota C\text{-}əC\ {}^{w}$	close $y\ C\iota C\text{-}\in\ {}^{w}$	open $y\ C\text{e}C\text{-}\in\ {}^{w}$
2.	close $y\ C\in C\text{-}əC\ {}^{y}$	close $y\ C\in C\text{-}əC\ {}^{w}$	close $y\ C\in C\text{-}əC\ {}^{w}$	close $y\ C\in C\text{-}\in\ {}^{w}$	open $y\ C\text{ɑ}C\text{-}\in\ {}^{w}$
4.	close $w\ C\in C\text{-}əC\ {}^{y}$	close $y\ C\in C\text{-}əC\ {}^{w}$	close $w\ C\in C\text{-}əC\ {}^{w}$	close $y\ C\in C\text{-}\in\ {}^{w}$	open $w\ C\text{ɑ}C\text{-}\in\ {}^{w}$
5.	close $w\ C\iota C\text{-}əC\ {}^{y}$	close $w\ C\iota C\text{-}əC\ {}^{w}$	close $w\ C\iota C\text{-}əC\ {}^{w}$	close $w\ C\iota C\text{-}\in\ {}^{w}$	open $w\ C\in C\text{-}\in\ {}^{w}$
3.	$\wp$ $CV_{\underline{I}}C\text{-}əC\ {}^{y}$	$\wp$ $CV_{\underline{I}}C\text{-}əC\ {}^{w}$	$\wp$ $CV_{\underline{I}}C\text{-}əC\ {}^{w}$	$\wp$ $CV_{\underline{I}}C\text{-}\in\ {}^{w}$	$\wp$ $CV_{\underline{I}}C\text{-}\in\ {}^{w}$
	$\wp$ close $C\wp C\text{-}əC\ {}^{y}$	$\wp$ close $C\wp C\text{-}əC\ {}^{w}$	$\wp$ close $C\wp C\text{-}əC\ {}^{w}$	y close $C\in C\text{-}\in\ {}^{w}$	$\wp$ close $C\text{ɑ}C\text{-}\in\ {}^{w}$

1.	[piʈiʃ]	[piʈuk]	[piʈun]	[piʈo]	[peʈo]
2.	[kheliʃ]	[kheluk]	[khelun]	[khelo]	[khælo]
4.	[boliʃ]	[boluk]	[bolun]	[bolo]	[bɔlo]
5.	[tuliʃ]	[tuluk]	[tulun]	[tulo]	[tolo]
3	[katiʃ]	[kaʈuk]	[kaʈun]	[keʈo]	[kaʈo]

(c) Non-finite forms

	CLOSE FORMS			OPEN FORMS	
	V	CV		V	ə C
	[-e]	[-le]	[-te]	[-a]	[-on]
	y/w y $CV_2C-\in$	y/w y $CV_2C-C\in$	y/w y $CV_2C-C\in$	y/w ɒ $CV_2C-\alpha$	y/w w $CV_2C-əC$
1.	close y y $C\iota C-\in$	close y y $C\iota C-C\in$	close y y $C\iota C-C\in$	open y ɒ $C\in C-\alpha$	open y w $C\in C-əC$
2.	close y y $C\in C-\in$	close y y $C\in C-C\in$	close y y $C\in C-C\in$	open y ɒ $C\in C-\alpha$	open y w $C\alpha C-ə\ C$
4.	close w y $C\in C-\in$	close w y $C\in C-C\in$	close w y $C\in C-C\in$	open w ɒ $C\in C-\alpha$	open w w $C\alpha C-ə\ C$
5.	close w y $C\iota C-\in$	close w y $C\iota C-C\in$	close w y $C\iota C-C\in$	open w ɒ $C\in C-\alpha$	open w w $C\in C-əC$
	y y $CV_1C-\in$	ɒ y $CV_1C-C\in$	ɒ y $CV_1C-C\in$	ɒ ɒ $CVC-\alpha$	ɒ w $CVC-əC$
3.	close y y $C\in C-\in$	close ɒ y $C\alpha C-C\in$	close ɒ y $C\alpha C-C\in$	open ɒ ɒ $C\alpha C-\alpha$	open ɒ w $C\alpha C-ə\ C$

Scatter					
1.	[piṭe]	[piṭle]	[piṭṭe]	[peṭa]	[peṭon]
2.	[khele]	[khelle]	[khelte]	[khæla]	[khælon]
4.	[bole]	[bolle]	[bolte]	[bola]	[bolon]
5.	[tule]	[tulle]	[tulte]	[tola]	[tolon]
3.	[keṭe]	[kaṭle]	[kaṭṭe]	[kaṭa]	[kaṭon]

10.2 VC- Stem Structure.[1]

Forms in VC- stem structure show similar features to those in CVC- stem pattern with different endings, except that there is no form with close front vowel [i] in the stem syllable.

The statement made for the forms in CVC- stem structure is valid for the forms in VC- stem structures except that both close forms and open forms show only one quality of vowel in the stem syllable in y prosody. Thus, in close form [heli], [e] in the stem syllable, in y prosody is the only vowel in forms in [i] ending; and in open form [hæle], [æ] in the stem syllable in y prosody is the only vowel in forms in [e] ending.[2]

1. See M.A.Hai, op.cit. p. 60ff. He has two scatters an- and ūṭh- for his examples. I have chosen hel-, hoṭ-, an- , and uṭh- as I have treated aspiration as a prosody and therefore structurally they are all VC- for me. The stem syllable of first two is h- prosodic and last two h̄ prosodic. Thus [hæle], [hoṭe] are ^{h}VC-V and [ane], and [uṭhe] are $\bar{h}$VC -V in structure.
2. See examples below.

The maximum degree of openness in y and w syllables is similar to those mentioned about the forms in stem structure CVC- + ∈

This will be clear from the following examples.

(a) Indicative forms

[-i] ending	[-e] ending	[-o] ending
[heli]	[hæle]	[hælo]
[ani]	[ane]	[ano]
[hoṭi]	[hɔṭe]	[hɔṭo]
[uṭhi]	[oṭhe][1]	[oṭho]
[-li] ending	[-le] ending	[-lo] ending
[helli]	[helle]	[hello]
[anli]	[anle]	[anlo]
[hoṭli]	[hoṭle]	[hoṭlo]
[uṭli]	[uṭle]	[uṭlo]

[-lam] ending	[-eche] ending
[hællam]	[heleche]
[anlam]	[eneche]
[hɔṭlam]	[hoṭeche]
[oṭlam]	[uṭheche]

(b) Imperative forms

[-iʃ] ending	[-uk] ending	[-o] (present) ending.	[-o] (future) ending
[heliʃ]	[heluk]	[hælo]	[helo]
[aniʃ]	[anuk]	[ano]	[eno]
[hoṭiʃ]	[hoṭuk]	[hɔṭo]	[hoṭo]
[uṭhiʃ]	[uṭhuk]	[oṭho]	[uṭho][2]

1. Alternative pronunciation is [uṭhe]
2. Alternative forms of M.A. Hai, (op.cit., § 50.p.61) are in two groups here.

(c) Non-finite forms

[-e] ending	[-a] ending	[-le]/[-te] ending		[-on] ending
[hele]	[hæla]	[helle]	[helte]	[haelon]
[ene]	[ana]	[anle]	[ante]	[anon]
[hoṭe]	[hɔṭa]	[hoṭle]	[hoṭte]	[hoton]
[uṭhe]	[oṭha][1]	[uṭle]	[uṭte]	[othon][2]

Indicative forms with ending [-i] show four vowel alternances, [e], [a], [o] and [u]; and forms with ending [-e] and [-o] show four vowel alternances, [æ], [a], [ɔ], [o]. Forms with [-i] are close forms and forms with [-e] and [-o] are open forms.

Forms with endings [-li], [-le] and [-lo] show four vowel alternances [e], [a], [o] and [u] in the stem syllable. They are close forms. Forms with [-lam] ending show four vowels in the stem syllable, [æ], [a], [ɔ] and [o]. They are open forms.

Forms with [-che] show three vowel alternances in the stem syllable of different forms, [e], [o] and [u]. These are close forms.

In this stem structure also indicative close forms are of two categories: (i) those exhibiting four vowel differences [e], [a], [o] and [u] in the stem syllable and (ii) those exhibiting three vowel differences, [e], [o], and [u] in the stem syllable.

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1. Alternative form is [uṭha]
2. Alternative form is [uṭhon]

Indicative open forms have four vowel alternances [æ] [a], [ɔ] and [o].

Indicative close forms whose ending structure is ι in ^{y} prosody the stem syllable has two degrees of openness in ^{w}prosody and one degree in each of ^{y} and ^{ɔ} prosodies.

Indicative open forms whose ending structure is -V, show four vowel alternances in the stem syllable where the ending syllable is mid in ^{y} and ^{w} syllable. The stem syllable has two degrees of openness in ^{w} prosody and one degree in each of ^{y} and ^{ɔ} prosodies.

Indicative close forms whose ending structure is -CV show four vowel alternances, where the ending syllable is close in ^{w} prosody, mid in $^{y/w}$ prosodies and open in ^{ɒ} prosody.

Indicative open forms whose ending structure is -CVC show four vowel alternances where the ending syllable is open unit in ^{ɒ} prosody. The stem syllable has two degrees of openness in ^{w} prosody and one degree in each of ^{y} and ^{ɒ} prosodies.

Indicative close forms whose ending structure is -əCV and ə is in ^{y} prosodic syllable, the stem syllable has two degrees of openness in ^{w} prosody and one degree in ^{y} prosody.

These can be formulated thus:

Indicative forms

VC- stem structure + V ending structure

	First syllable	Second syllable
Close forms.[1]	[e], [a], [o], [u].	[i]

close
y/w y
$V_1C - \iota$

close
w y
$V_1C - \iota$

close
ɔ y
$V_1C - \iota$

Open forms:[2]

[ɛ], [a], [ɔ], [o] [e]/[o]

open
y/w/ɔ y/w
$V_1C - \epsilon$

open
w y/w
$V_1C - \epsilon$

VC + CV

Close forms[3]	[e], [a] [o], [u]	[i]/[e]/[o]

close
y/w y/ι/ϵ y/w
$V_1C -$

close
w y/ι/ϵ y/w
$V_1C -$

close
ɔ y/ι/ϵ y/w
$V_1C -$

1. See indicative forms with [-i] on page 333.
2. See indicative forms with [-e] and [-o] on page 333
3. See indicative forms with [-1i],[-1e] and [-1o] on page 333

VC + CVC

open forms :[1] [æ], [a], [ɔ], [o] [a]

$$\frac{\text{open}}{y/w/\text{ø}\quad \text{ø}}\quad V_1C - C\omega C$$

$$\frac{\text{open}}{w\quad \text{ø}}\quad V_1C - C\omega C$$

VC + əCV

Close forms:[2] [e] [o] [u] [e]

$$\frac{\text{close}}{y/w\quad y\quad y}\quad V_1C - \text{ə}\ C\in$$

$$\frac{\text{close}}{w\quad y\quad y}\quad V_1C - \text{ə}\ C\in$$

Imperative forms where the endings are [iʃ] and [uk] exhibite four vowels in the stem syllable, [e], [a], [o] and [u] they are close forms. Forms whose ending is [-o] (Present) exhibit four vowels in the stem syllable, [æ], [a], [ɔ] and [o]. They are open forms. Imperative forms with [-o](future) exhibit three vowels in the stem syllable [e], [o] and [u]. They are close forms.

Imperative close forms in this structure too form two categories: (i) those exhibiting four vowel alternances, [e] [a], [o] and [u] and (ii) those exhibiting three vowel

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1. See indicative forms with [-lam] on page 333.
2. See indicative forms with [-eche] on page 333.

alternances [e], [o] and [u].

Imperative close forms whose ending structure is -əC, and the second syllable is ^{y} or ^{w} prosodic have two degrees of openness in ^{w} prosody and one degree in each of ^{y} and $^{\wp}$ prosodies in the stem syllable.

Imperative close forms whose ending structure is -V and the syllable is mid in ^{w} prosody, have two degrees of openness in ^{w} prosody and one degree in ^{y} prosody in the stem syllable.

Imperative open forms whose ending structure is -V and the syllable two of the form is mid in ^{w} prosody have three degrees of openness in $^{\wp}$ prosody and one degree in ^{w} prosody in the stem syllable.

These can be formulated thus:

Imperative forms

VC + əC

	First syllable	Second syllable
Close forms.[1]	[e], [a],[o],[u]	[i]/[u]

$$\frac{\text{close}}{y/w \quad V_1C\text{-}əC \quad y/w}$$

$$\frac{\text{close}}{w \quad V_1C\text{ -}əC \quad y/w}$$

$$\frac{\text{close}}{\wp \quad V_1C\text{- }əC \quad y/w}$$

---

1. See imperative forms with [-iʃ] and [-uk] on page 333.

VC + V

Close forms[1]: [e], [o], [u] [o]

$$\frac{\text{close}}{y/w \qquad w} \quad V_1C- \in$$

$$\frac{\text{close}}{w \qquad w} \quad V_1C- \in$$

open forms[2]: [æ], [a], [ɔ], [o] [o]

$$\frac{\text{open}}{y/w/ɔ \qquad w} \quad V_1C- \in$$

$$\frac{\text{open}}{w \qquad w} \quad V_1C- \in$$

Non-finite close forms are of two categories: (i) those exhibiting three vowel alternances in the stem syllable, [e], [o] and [u] and (ii) those exhibiting four vowel alternances [e], [a] [o] and [u].

Non-finite open forms exhibit four vowels in the stem syllable [æ], [a], [ɔ] and [o].

Non-finite close forms whose ending structure is V in ^{y} prosody the stem syllable has two degrees of openness in ^{w} prosody and one degree in ^{y} prosody.

Non-finite close forms whose ending structure is -CV and unit ∈ in ^{y} prosody constitute V in ending structure, the

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1. See imperative forms with [-o](future) on page 333.
2. See imperative forms with [-o] (present) on page 333.

stem syllable has two degrees of openness in ^{w} prosody and one degree in each of ^{y} and $^{\wp}$ prosodies.

Non-finite open forms whose ending structure is -V or -əC, and -V is a single term system of α in $^{\wp}$ prosody and -ə- in əC structure is in ^{w} prosody, the stem syllable has two degrees of openness in ^{w} prosody and one degree in each of ^{y} and $^{\wp}$ prosodies.

These can be formulated thus:

Non-finite forms

VC + V

	First syllable	Second syllable
Close forms:[1]	[e], [o], [u]	[e]
	$\frac{\text{close}}{y/w \quad y}$ $V_1C- \in$	
	$\frac{\text{close}}{w \quad y}$ $V_1C- \in$	
open forms:[2]	[æ], [a], [ɔ], [o]	[a]
	$\frac{\text{open}}{y/w/\wp \quad \wp}$ $V_1C- \alpha$	
	$\frac{\text{open}}{w \quad \wp}$ $V_1C- \alpha$	

1. See non-finite forms with [-e] on page 334.
2. See non-finite forms with [-a] on page 334.

VC + CV

Close forms:[1] [e], [a], [o], [u] [e]

$$\frac{\text{close}}{\overset{y/w}{V_1C\text{-}C}\overset{y}{\in}}$$

$$\frac{\text{close}}{\overset{\text{ø}}{V_1C\text{-}C}\overset{y}{\in}}$$

$$\frac{\text{close}}{\overset{w}{V_1C\text{-}C}\overset{y}{\in}}$$

VC + əC

open forms:[2] [æ], [a], [ɔ], [o] [o]

$$\frac{\text{open}}{\overset{y/w/\text{ø}}{V_1C\text{-}}\overset{w}{\text{əC}}}$$

$$\frac{\text{open}}{\overset{w}{V_1C\text{-}}\overset{w}{\text{əC}}}$$

Same statements as for the different forms in CVC- stem structure with different ending structures, can be made about the relation of different grammatical categories with the close forms and open forms of VC- stem structure with corresponding endings. They are not included here in order to avoid repetition.

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1. See non-finite forms with [-le]/[-te] on page 334.
2. See non-finite forms with [-on] on page 334.

Table of the phonological formulae for the stem and ending syllables of CV stem structure

(a) Indicative forms

	CLOSE FORMS					OPEN FORMS		
	-V	-CV			-əCV	V		CVC
	[-i]	[-li]	[-le]	[-lo]	[-eche]	[-e]	[-o]	[-lam]
	y/w y $V_1C-\iota$	y/w y $V_1C-C\iota$	y/w y $V_1C-C\in$	y/w w $V_1C-C\in$	y/w -y- $V_1C-\partial C\in$	y/w/ y $V_1C-\in$	y/w/ɔ w $V_1C-\in$	y/w/ɔ ɔ $V_1C-C\alpha C$
	w y $V_1C-\iota$	w y $V_1C-C\iota$	w y $V_1C-C\in$	w w $V_1C-C\in$	w -y- $V_1C-\partial C\in$	w y $V_1C-\in$	e w $V_1C-\in$	w ɔ $V_1C-C\alpha C$
1.	close y y $\in C-\iota$ close	close y y $\in C-C\iota$ close	close y y $\in C-C\in$ close	close y w $\in C-C\in$ close	close y -y- $\in C-\partial C\in$ close	open y y $\alpha C-\in$ open	open y w $\alpha C-\in$ open	open y ɔ $\alpha C-C\alpha C$ open
2.	w y $\in C-\iota$	w y $\in C-C\iota$	w y $\in C-C\in$	w w $\in C-C\in$	w -y- $\in C-\partial C\in$	w y $\alpha C-\in$	w w $\alpha C-\in$	w ɔ $\alpha C-C\alpha C$
4.	close w y $\iota C-\iota$	close w y $\iota C-C\iota$	close w y $\iota C-C\in$	close w w $\iota C-C\in$	close w -y- $\iota C-\partial C\in$	open w y $\in C-\in$	open w w $\in C-\in$	open w ɔ $\in C-C_\alpha C$
	ɔ y $V_1C-\iota$	ɔ y $V_1C-C\iota$	ɔ y $V_1C-C\in$	ɔ w $V_1C-C\in$	y y $V_1C-C\in$	ɔ y $V_1C-\in$	ɔ w $V_1C-\in$	ɔ ɔ $V_1C-C_\alpha C$
3.	close ɔ y $\alpha C-\iota$	close ɔ y $\alpha C-C\iota$	close ɔ y $\alpha C-C\in$	close ɔ w $\alpha C-C\in$	close y -y- $\in C-\partial C\in$	open ɔ y $\alpha C-\in$	open ɔ w $oC-\in$	open ɔ ɔ $\alpha C-C\alpha C$
1.	[heli]	[helli]	[helle]	[hello]	[heleche]	[hæle]	[hælo]	[hællam]
2.	[hoṭi]	[hoṭṭi]	[hoṭle]	[hoṭlo]	[hoṭeche]	[hɔṭe]	[hɔṭo]	[hɔṭlam]
4.	[uṭhi]	[uṭli]	[uṭle]	[uṭlo]	[uṭheche]	[oṭhe]	[oṭho]	[oṭlam
3.	[ani]	[anli]	[anle]	[anlo]	[eneche]	[ane]	[ano]	[anlam]

(b) Imperative forms

	CLOSE FORMS			OPEN FORMS
	-əC		-V	-V
	[-iʃ]	[-uk]	[-o]future	[-o]present
	y/w -y- V_1C-ə C w -y- V_1C-ə C	y/w -ɣ- V_1C-ə C w -ɣ- V_1C -ə C	y/w -y- V_1C-ə C w -y- V_1C -ə C	y/w/ɔ w V_1C- ∈ w V_1C-
1.	close y -y- ∈C-ə C	close y -ɣ- ∈C-əC	close y w ∈C- ∈	open y w ɑC- ∈
2.	close w -y- ∈C-əC	close w -ɣ- ∈C-əC	close w w ∈C- ∈	open w w ɑC- ∈
4.	w close -y- ɩC -əC	w close -ɣ- ɩC- əC	w close w ɩC- ∈	w open w ∈C- ∈
	ɔ -y- V_1C- əC	ɔ -ɣ- V_1C- əC	y w V_1C - ∈	ɔ w V_1C- ∈
3.	ɔ close -y- ɑC-əC	ɔ close -ɣ- ɑC- əC	close y w ɑ-C - ∈	open ɔ w ɑC - ∈
1.	[heliʃ]	[heluk]	[helo]	[hœlo]
2.	[hoʈiʃ]	[hoʈuk]	[hoʈo]	[hɔʈo]
4.	[uʈhiʃ]	[uʈhuk]	[uʈho]	[oʈho]
3.	[aniʃ]	[anuk]	[eno]	[ano]

(c) Non-finite forms

	CLOSE FORMS			OPEN FORMS	
	-V	-CV		-V	-C
	[-e]	[-le]	[-te]	[-a]	[-on]
	$y/w\ V_1C-\in^{y}$ $w\ V_1C-\in\ ^{y}$	$y/w\ V_1C-C\in^{y}$ $w\ V_1C-C\in\ ^{y}$	$y/w\ V_1C-C\in^{y}$ $w\ V_1C-C\in\ ^{y}$	$y/w/\wp\ V_1C-\alpha^{\wp}$ $w\ V_1C-\alpha$	$y/w/\wp\ V_1C-\in C^{w}$ $w\ V_1C-\in C^{w}$
1.	Close $y\ \in C\ -\in^{y}$	close $y\ \in C-C\in^{y}$	close $y\ \in C-C\in^{y}$	open $y\ \alpha C-\alpha^{\wp}$	open $y\ \alpha C-\in C^{w}$
2.	close $w\ \in C-\in\ ^{y}$	close $w\ \in C-C\in\ ^{y}$	close $w\ \in C-C\in\ ^{y}$	open $w\ \alpha C-\alpha^{\wp}$	open $w\ \alpha C-\in C^{w}$
4.	close $w\ \iota C-\in\ ^{y}$	close $w\ \iota C-C\in\ ^{y}$	close $w\ \iota C-C\in\ ^{y}$	open $w\ \in C-\alpha^{\wp}$	open $w\ \in C-\in C^{w}$
	$y\ V_1C-\in\ ^{y}$	$\wp\ V_1C-\in\ ^{y}$	$\wp\ V_1C-C\in\ ^{y}$	$\wp\ V_1C-\alpha^{\wp}$	$\wp\ V_1C-\in C^{w}$
3.	close $y\ \in C-\in\ ^{y}$	close $\wp\ \alpha C-\in\ ^{y}$	close $\wp\ \alpha C-C\in\ ^{y}$	open $\wp\ \alpha C-\alpha^{\wp}$	open $\wp\ \alpha C-\in C^{w}$
1.	[hele]	[helle]	[helte]	[hæla]	[hælon]
2.	[hoţe]	[hoţle]	[hoţte]	[hɔţa]	[hɔţon]
4.	uthe]	[uţle]	[uţte]	[oţha]	[oţhon]
3,	[ene]	[anle]	[ante]	[ana]	[anon]

Unlike CVC- stem structure, forms in CV stem structure show examples of four vowel alternances with different endings. Forms in this structure involve phonetic diphthongal articulation in some categories. That is to say, where the stem syllable is open and ending is -V, some of the forms in CV- stem structure give phonetic expression of a diphthong. It has already been stated[1] that diphthongal articulations are structurally a combination of ∗V + V or ə + V.[2]

The forms in this structure also involve a junction prosody: ^{y} , ^{w}, or ^{g} in some categories.[3]

This will be made clear in the course of the discussion. The following forms of CV- stem structure with endings of different structures are given for example.

(a) Indicative forms

(i) CV + V

[-i] ending		[-e] ending[4]		[-o] ending	
1. [i]-[i]	[dii][5]	[æ]-[e]	[dæe]	[æ]-[o]	[dæo][6]
2. [a]-[i]	[pai]	[a]-[e]	[pae]	[a]-[o]	[pao]
3. [ɔ]-[i]	[bɔi]	[ɔ]-[e]	[bɔe]	[ɔ]-[o]	[bɔo]
4. [u]-[i]	[ʃui]	[o]-[e]	[ʃoe]	[o]-[o]	[ʃoo]

1. See § 5.2.
2. There are only two diphthongal articulations, e.g. in [doura] and [aora] for which a V can be stated. Everywhere else a phonetic diphthong is to be understood as a combination of two V or a ə+ V element.
3. See Junction- prosodies, § 7.3.6
4. Forms with [-en] do not show any vowel sequence. They have the phonetic expression of the vowel of the stem, and show same four vowel differences in the stem syllable as the forms with [-e] e.g. [dæn], [pan], [bɔn], [ʃon].
5. Alternative form [dei] 6. Alternative form [dao]

(ii) CV + CV

[-li] ending		[-le] ending		[-lo] ending	
1. [i]-[i]	[dili]	[i]-[e]	[dile]	[i] -[o]	[dilo]
2. [e]-[i]	[peli]	[e]-[e]	[pele]	[e] -[o]	[pelo]
3. [o]-[i]	[boyli]	[o]-[e]	[boyle]	[o] -[o]	[boylo]
4. [u]-[i]	[ʃuli]	[u]-[e]	[ʃule]	[u]-[o]	[ʃulo]

Forms in ending [-tiʃ] show vowel sequences similar to those in [-li].

Forms in ending [te] [-ten] show vowel sequences similar to those in [le].

Forms in ending [to] show vowel sequences similar to those in [-lo].

[-chi] ending		[-che] ending		[-cho] ending	
1. [i]-[i]	[dicchi]	[i]-[e]	[dicche]	[i]-[o]	[diccho]
2. [a]-[i]	[pacchi]	[a]-[e]	[pacche]	[a]-[o]	[paccho]
3. [o]-[i]	[boychi]	[o]-[e]	[boyche]	[o]-[o]	[boycho]
4. [u]-[i]	[ʃucchi]	[u]-[e]	[ʃucche]	[u]-[o]	[ʃuccho]

[-bi] ending		[-be] ending		[-bo] ending	
[i]-[i]	[dibi]	[e]-[e]	[dibe][1]	[e]-[o]	[dibo][3]
[a]-[i]	[pabi]	[a]-[e]	[pabe]	[a]-[o]	[pabo]
[o]-[i]	[boybi]	[o]-[e]	[boybe]	[o]-[o]	[boybo]
[u]-[i]	[ʃubi]	[u]-[e]	ʃube][2]	[u]-[o]	[ʃubo][4]

1. Alternative pronunciation is [debe]
2. Alternative pronunciation is [ʃobe]
3. Alternative pronunciation [debo]/[dobo]
4. Alternative pronunciation [ʃobo]

Note that unlike forms in CVC- stem structures some forms in CV- structure e.g. forms in [-ch-] and [-b-] endings do not show vowel sequences similar to those in ending [-l-].

(iii) CV + CVC		(iv) CV + əCV	
[-lam] ending		[-eche] ending	
[i]-[a]	[dilam]	[i]-[e]	[dieche]
[e]-[a]	[pelam]	[e]-[e]	[peyeche]
[o]-[a]	[boylam]	[o]-[e]	[boyeche]
[u]-[a]	[ʃulam]	[u]-[e]	[ʃuyeche]

Forms in [-tam] are similar to those in [-lam]

Forms in [echi], [echiʃ], [echo], [echen], [echilam] [echili], [echile], [echilo], [echilen] are similar to those in [-eche].

(b) Imperative forms

(i) CV + ∅		(ii) CV + əC[1]			
		[-iʃ] ending		[-uk] ending	
[e]	[de]	[i] - [diʃ]		[i]	[dik][3]
[a]	[pa]	[a] - [paʃ]		[a]	[pak]
[ɔ]	[bɔ]	[o] - [boʃ][2]		[o]	[bok]
[o]	[ʃo]	[u] - [ʃuʃ]		[u]	[ʃuk]

1. It will be seen that the forms in this stem structure with endings [-iʃ], [-uk] and [-un] have the phonetic expression of the vowel of the stem and show same four vowel differences in the stem syllable as the forms in ending [-i]. Although these forms do not show phonetically two vowel sequences and although no vowel harmony statement for these forms can be made they are included in the examples for comparison and contrast with the forms in other endings.
2. cf. [bɔʃ] with [boʃ]. The former is CVC + ∅, the latter is CV + əC structurally.
3. Alternative pronunciation is [dek].

Forms in [un] ending are similar to those in [-uk].

(iii) CV + V

	[-o] ending (Present)		[-o] ending (Future)	
1.	[æ]-[o]	[dæo]	[i]-[o]	[dio]
2.	[a]-[o]	[pao]	[e]-[o]	[peyo]
3.	[ɔ]-[o]	[bɔo]	[o]-[o]	[boyo]
4.	[o]-[o]	[ʃoo]	[u]-[o]	[ʃuyo]

(C) Non-finite forms

(i) CV + V

	[-e] ending		[-a] ending	
1.	[i]-[e]	[die]	[æ]-[a]	[dæwa]
2.	[e]-[e]	[peye]	[a]-[a]	[pawa]
3.	[o]-[e]	[boye]	[ɔ]-[a]	[bɔwa]
4.	[u]-[e]	[suye]	[o]-[a]	[ʃowa]

(iii) CV + CV

[-le] ending		[-te] ending	
[i]-[e]	[dile]	[i]-[e]	[dite]
[e]-[e]	[pele]	[e]-[e]	[pẹte]
[o]-[e]	[boyle]	[o]-[e]	[boyte]
[u]-[e]	[ʃule]	[u]-[e]	[ʃute]

(iv) CV + eC

[- on] ending

[æ]-[o]	[dæon]
[a]-[o]	[paon]
[ɔ]-[o]	[bɔon]
[o]-[o]	[ʃoon]

1. Alternative form [dao]

(i) CV + V

It will be seen from the above examples that the forms in different endings in this stem structure involve complicated vowel sequences and junction features, although a separate statement will have to be made, a similar though not exactly identical relation, as for the forms in CVC- stem structures of close forms and open forms can be stated for the forms in this structure. With the close vowel [i] in the ending forms of different scatters exhibit [i], [a], [o] and [u], in the stem syllable and with the half-close vowel [-e] or [-o] in the ending they exhibit [æ], [a], [ɔ] and [o]. Forms in ending [-i] are close forms and forms in ending [-e] or [-o] are open forms.

In close forms where the second syllable is close in ^{y} prosody the first syllable is close, mid and open in all three prosodies, ^{y}, ^{w}, and ^{ɔ}. In ^{y} prosodic syllable the vowel in the stem syllable has one quality between close and half-close, and in ^{w} prosodic syllable the vowel in the stem syllable has two qualities, between close and half-close and between half-close and half-open. and in ^{ɔ} prosodic syllable the vowel in the stem syllable is open neither front nor back.

In open forms where the vowel of the second syllable is mid in ^{y} or ^{w} prosidy, the first syllable is mid, and open in all three prosodies, ^{y}, ^{w}, and ^{ɔ}. In ^{y} prosodic syllable the vowel in the stem has one quality

between half-open and open, and in ^{w} prosodic syllable the vowel in the stem syllable has two qualities - between half-close and half-open and between half-open and open; and in $^{\alpha}$ prosodic syllable the vowel in the stem syllable is open neither front nor back.

Vowel qualities of the close forms and open forms are the same as for the forms in CVC- or VC stem structure in the corresponding ending, except in the case of the forms of the scatter di- where the vowel in the stem syllable in the close form is between close and half-close, and in the open form is between half-open and open.

Phonetically each of the vowels [i], [a], [o], [u] of the forms [dii], [pai], [boi] and [ʃui] forms the starting point of the diphthong which moves in the direction of [i]; each of the vowels [æ], [a], [ɔ], and [o] of the forms [dæe] [pae], [bɔe] and [ʃoe] forms the starting point of the diphthong which moves in the direction of [e]; and each of the vowels [æ], [a], [ɔ] and [o] of the forms [dæo], [pao], [bɔo] and [ʃoo] forms the starting point of the diphthong which moves in the direction of [o].[1]

CV + CV, -CVC

In the forms of the scatters in endings [-li], [-le] and [-lo] four vowels: [i], [e], [o] and [u] are possible in the stem syllable. The forms in endings [-li], [-le] and [-lo]

1. See Diagram ~~on page~~ under § 5.2

are close forms. Unlike the forms in CVC- stem structure forms in [-lam] ending in this structure exhibit four vowel alternances [i], [e], [o] and [u] in the stem syllable. All forms in ending [-lam] are close forms. All the forms in endings [-li], [-le] [-lo] and [-lam] have same four vowel differnces in the stem syllable as the forms of the CVC- stem structure in[-eche]ending except that the first syllable is mid in ^{w} prosody the junction is ^{y} prosodic in this structure.[1]

In each of ^{y} and ^{w} prosodic syllables the vowel in the stem syllable has two qualities, between close and half-close and between half-close and half-open. The maximum degree of openess in ^{y} and ^{w} prosodic syllables is between half-close and half-open. One important point to be noted is that there is no ^{o} prosodic syllable in the form of the scatter where the vowel of the stem syllable is open neither front nor back in the forms with other endings, both in 'close forms' and 'open forms.'[2]

The forms in endings [-chi], [-che] and [-cho] show four vowels in the stem syllable: [i], [a], [o] and [u]. In addition the forms of the scatters di- pa- and ʃu- show a feature of geminated junction[3] and the forms of the scatters bo- show a feature of palatalization in the junction. That is, in the linking feature of stem and ending of the forms from √di √pa and √ʃu with ending whose initial consonant is

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1. See Prosodies of junction § 7.3.6.
2. e.g. In the forms with the endings [-i], [-e], [-o] discussed cf. forms in CVC- stem structure in [-eche] ending.
3. See Prosodies of junction § 7.3.6 See also § 11.2.4

palatoalveolar voiceless aspirated plosive [-ch-] there is a long consonantal articulation. This feature of geminated junction is treated prosodically and is denoted by a raised ^{g} in the formulae. In the linking feature of stem and ending of the forms from √bɔ with ending initiated by [-ch-] there is a ^{y} glide or palatalization. This feature of palatalization in the junction is treated prosodically and is denoted by a raised ^{y} in the formulae. It should be noted that ^{y} has also been employed as a prosodic symbol for the prosody of the syllable as a whole. But this ^{y} prosody of the stem and ending junction is different from the ^{y} prosody of the syllable as a whole.[1]

These forms show exactly the same four vowel differences as the forms in [i] ending. They are close forms. In these forms where the second syllable is close or mid in ^{y} or ^{w} prosodies, the first syllable is close, mid and open in all three prosodies, ^{y}, ^{w}, and ^{ɔ} Where the V in first syllable is close unit in y/w prosody or open in ɔ prosody the junction is ^{g} prosodic, and where V of the first syllable is mid unit in ^{w} prosody the junction is ^{y} prosodic.

The forms in endings [bi], [-be] and [-bo] exhibit four different vowels, [i], [a], [o] and [u] in the stem syllable. They show similar vowel alternances as forms of different scatter in ending [-i], except that in the junction of the forms of the scatter bɔ- there is a ^{y} feature. They are close forms. In the forms where the second syllable is close or mid in ^{y} or ^{w} prosody, the first syllable is close, mid or

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1. See for details Chapter 9.

open in all three prosodies, ^{y} , ^{w} and ^{o} where the first syllable is mid in ^{w} prosody, the junction is ^{y} prosodic.

CV + əCV

Forms in [-eche] ending show four vowel alternances [i], [e], [o] and [u], in the stem syllable of the forms of different scatters. In addition they all have a feature of palatalization in the junction. They are close forms. These forms have the same four vowel alternances in the stem syllable as the forms in [-le], [li] [-lo] or [-lam] ending. In each of ^{y} and ^{w} prosodic syllable the vowel in the stem syllable has two qualities, between close and half-close and between half-close and half-open. The maximum degree of openness in ^{y} and ^{w} prosodic syllables is between half-close and half-open. There is no ^{o} prosodic syllable in the forms of the scatter where the vowel of the stem syllable is open neither front nor back in other endings. Where the second syllable is mid in ^{y} prosody the first syllable is close and mid in ^{y} and ^{w} prosodics. The stem and ending linking feature of the forms in this ending is ^{y} prosodic. These forms in [-eche] ending differ from the forms in [-li], [-le], [-lo] or [-lam] ending in that the forms in [-eche] of all the scatters show ^{y} feature in the junction whereas in the forms with endings [-li], [-le] [-lo] and [-lam] show ^{y} feature in the junction in the forms of the scatter bɔ only.

It is important to note that there is a remarkable variation in the vowel qualities of the stem syllable of the

forms of the scatter di- with different endings. In close forms where the ending is [-i] the vowel of the stem syllable is between close and half-close (as in [dii]). In open form where the ending is [-e] or [-o] the vowel of the stem syllable is between half-open and open (as in [dɞe] and [dɞo]). In the alternative pronunciation of the close form in [-i] ending the vowel of the stem syllable is between half-close and half-open (as in [dei]), and in the alternative pronunciation of the open form in ending [-o] the vowel of the stem syllable is open neither front nor back (as in [dao]). In one alternative pronunciation of the form in ending [-be] and [-bo] the vowel of the stem syllable is between half-close and half-open (as in [debe], [debo]). There is yet another alternative pronunciation of the form with [-bo] ending as [dobo] where the vowel in stem syllable is between half-close and half-open back characterized by rounding.

(b) Imperative forms

In the forms where the ending is ∅ four vowels [e], [a], [ɔ] and [o] are possible, in the forms in endings [-iʃ] and [-uk] four vowels [i], [a], [o] and [u] are possible. It will be seen from the examples that the forms in endings ∅, [-iʃ] and [-uk] do not show phonetically two vowel sequences and thus no vowel harmony relation can be stated. But it is interesting to note that these monosyllabic forms in endings ∅, show four vowel differences in the stem syllable which are from different the forms in any ending; and forms in endings [-iʃ] and [-uk]

show same vowel differences in the stem syllables as the indicative forms in [-i]. The forms in ∅ ending are open forms and those in ending [iʃ] and [-uk] are close forms. In open forms the syllable is mid and open in all three prosodics ^{y}, ^{w} and ^{ɔ}. In ^{y} prosodic syllable the vowel has a quality between half-close and half-open and in ^{w} prosodic syllable the vowel has two qualities, between half-close and half-open and between half-open and open. In ^{ɔ} syllable the vowel is a central open one neither front nor back. In close forms (i.e. forms in [-iʃ] and [-uk]) the syllable is close mid, and open in all three prosodies, ^{y}, ^{w} and ^{ɔ}, In ^{y} syllable the vowel has a quality between close and half close, and in ^{w} syllable the vowel has two qualities, between half-close and half-open and between half-open and open, and in ^{ɔ} syllable the vowel is a central open neither front nor back.

In the forms where the ending is [-o] (present), four vowel differences are possible in the stem syllable: [ɷ], [a] [ɔ] and [o] and in the forms where the ending is [-o] (future) four vowel differences are possible in the stem syllable: [i] [e], [o] and [u]. The forms in ending [-o] (present) are open forms and those in [-o](future) are close forms.

In open forms where the second syllable is mid in ^{w} prosody, the first syllable is mid and open in all three prosodies, ^{y}, ^{w} and ^{ɔ}. In ^{y} prosodic syllable the vowel has a quality between half-open and open and in ^{w} prosodic syllable the vowel has two qualities, between half-close and half-open and between half-open and open. In ^{ɔ} prosodic syllable

the vowel is a central open , neither front nor back.

Open forms in [-o](present) show identical features to the indicative forms in [-o] ending.

In close forms where the second syllable is mid in ^{w} prosody, the first syllable is close and mid in ^{y} and ^{w} prosodies. In each of ^{y} and ^{w} prosodic syllables the vowel has two qualities, between close and half-close and half-close and half-open. These close forms do not have any ^{o} prosodic stem syllable.

In addition, these close-forms in [-o](future) exhibit a linking feature of palatalization in the stem and ending junction. These forms show identical feature to the indicative forms in [-eche].

Phonetically each of the vowels [æ], [a], [ɔ] and [o] forms the starting point of the diphthong which moves in the direction of [o].1

(c) Non-finite forms

In the non-finite forms where the ending is [-e] four vowel differences : [i], [e], [o] and [u] are possible in the stem syllable. The forms in [-e] exhibit closeness in the stem syllable and are, therefore, close forms. In these forms where the second syllable is mid in y prosody, the first syllable is close and mid in y and w prosodies.

The scatters have no form exhibiting ^{o}

1. See § 5.2. They are similar to those in indicative forms in [-o] ending. (Supra).

prosodic stem syllable. The vowel qualities are never more open than between half-close and half-open. This is the maximum degree of openness even for the syllable in the form [peɣe] of the scatter pa-. These forms also exhibit ^{y} prosodic junction feature.

These non-finite forms in [-e] ending may be compared with the imperative forms in ending [-o] (future) and also with the indicative forms in [-eche]. They all show identical vowel harmony relation.

The forms in [-a] and [-on] endings show four different vowels in the stem syllable: [æ] [a], [ɔ] and [o]. They are open forms. In these forms where the vowel of the second syllable is [a] or [o] the first syllable is mid and open in all three prosodies ^{y}, ^{w} and ^{ɔ}. The vowel quality in ^{y} prosodic syllable is between half-open and open, and in ^{ɔ} prosodic syllable is open neutral neither front nor back. In ^{w} prosodic syllable the vowel has two qualities, between half-close and half-open and between half-open and open. In addition these forms show a ^{w} prosodic feature in the stem ending junction.[1]

Note that it is only in these forms in the monosyllabic stem structures where ^{w} is stated as prosody of stem ending junction.

The non-finite forms in [-le] and [-te] endings show four vowel differences in the stem syllable: [i], [e], [o] and [u]. These forms show exactly the same phonetic alternances

1. See prosodies of junction § 7.3.6

as those in indicative [-le] ending. These are stated as close forms. The statement made for the inidcative forms will hold good for these non-finite forms.

The above statement can be summarised as follows:

Just as in the case of the forms in CVC- stem structure so also in the case of the forms in CV- stem structure vowel harmony cannot be stated purely on the basis of phonetic sequences, but an interrelation between the second and the first syllable can be shown. In addition, in the forms of this structure prosodic feature in the stem-ending junction is also to be taken into consideration. The interrelation of the system is concerned with (a) the close forms of verb and (b) the open forms of verb.

In close forms the degree of openness is never more open than between half-close and half-open, and in open forms degree of closeness is never more close than between half-close and half-open in both ^{y} and ^{w} syllables.

Unlike forms in CVC- structure close forms in this structure form five categories and open forms three categories.

Close forms.

i) Forms exhibiting vowels : [i], [a], [o] and [u] in the stem syllable indicative forms in [-i] ending and forms in [-iʃ] ending.

ii) Forms exhibiting vowels [i], [a], [o] and [u] in the stem syllable and showing ^{y} feature in the stem-ending junction of the forms of the scatter bɔ- (indicative forms in [-b-] ending).

iii) Forms exhibiting vowels :[i], [a], [o] and [u] in the stem syllable and showing ^{g} prosodic feature in the junction of the forms of the scatters di- pa- and ʃu- and ^{y} prosodic feature in the forms of the scatters bɔ- (indicative forms with [-ch] ending).

iv) Forms exhibiting vowels : [i], [e], [o] and [u] in the stem syllable and showing ^{y} feature in the junction of the forms of the scatter bɔ- (indicative forms in [-li] and [-lam] endings, and non-finite forms in [-te] and [-le] endings).

v) Forms exhibiting vowels [i], [e], [o] and [u] in the stem syllable and showing ^{y} feature in the junction of the forms of all the other scatters than di- (indicative forms in [-eche] ending, imperative forms in [-o](future) and non-finite forms in [-e].)

Open forms:

(i) Forms exhibiting four vowels : [ɷ], [a], [ɔ], and [o] in the stem syllable (indicative forms in ending [-o] imperative forms in [-o] (Present) ʃ.

(ii) Forms exhibiting four vowels: [ɷ], [a], [ɔ], [o] in the stem syllable and showing ^{w} prosodic feature in the junction (non-finite forms in [-a] and [-on]).

(iii) Forms showing four vowels : [e], [a], [ɔ], and [o] in the stem syllable (imperative forms in ∅ ending).

It will be seen that vowel [a] in the stem syllable is exhibited in three categories of close forms (i, ii, iii), and all

categories of open forms. Two categories of close forms do not show [a] in the stem syllable. [i] and [u] are absent in the stem syllable of open forms. [e] in the stem syllable is shown in two categories of close forms (iv and v) and one category of open form (iii).

Each of indicative, imperative and non-finite forms is either an open form or a close form of any kind.

Indicative close forms whose ending structure is -V , show four vowel alternances in the stem syllable where the ending syllable is close in y prosody. The stem syllable has two degress of openness in w prosody, and one degree of openness in each of y and ɔ prosodies

Indicative open forms whose ending structure is -V, show four vowel alternances in the stem syllable where the ending syllable is mid in y and w prosodies. The stem syllable in each of y and ɔ prosodies has one degree of openness and in w prosody two degrees of openness.

Indicative close forms whose ending structure is CV(C) show two kinds of four different vowel alternances in the stem syllable.

i) Those whose ending initial C is [-l-] and the second syllable is close in ^{y}, open in ^{o}, and mid in ^{y} and ^{w} prosodies. The stem syllable has two degrees of openness in ^{y} and ^{w} prosodies. There is no ^{o} prosodic syllable in the stem in the forms with this ending structure. The junction of the form whose stem syllable is mid in ^{w} prosody is ^{y} prosodic.

ii) Those whose ending initial C is [ch-] or [b-] and the second syllable is close in ^{y} and mid in ^{y} and ^{w}- prosodies. The stem syllable has two degrees of openness in ^{w} prosody, one degree of openness in each of ^{y} and ^{o}prosody . The junction of the form whose stem syllable is mid in ^{w} prosody is ^{y} prosodic.

Indicative forms whose ending structure is -əCV show four vowel alternances in the stem syllable where the ending initial ^ syllable is in ^{y} prosody. The stem syllable has two degrees of openness in ^{y} and ^{w} prosodies. There is no ^{o} prosodic syllable in the stem in the forms in this ending structure. The vowel alternances and the prosodic features in the forms in -əCV ending structure are similar to those in the forms in -CV(C) ending structure whose initial C is [-l-], except that the forms whose generalized structure is CV-əCV show a junction prosody ^{y} in the forms of all the scatters except di-, and the forms whose generalized structure is CV-CV(C) show a junction prosody ^{y} in only the forms of the scatter bə-.

It will be clear from the above statement that in the stem structure CV- the indicative forms with endings [-e] and [-o] are open forms and the forms with all the other endings are close forms.

This shows that the statement about vowel harmony can not be made without referring to the interrelation of the stem-ending junction. This interdependence of relation of the vowel sequences of stem and ending with the junction prosody relates to the statement of relevance of open form or close form in terms of vowel harmony. That is to say, vowel harmony can not be stated purely on the basis of vowel sequences of stem and ending but the relation between the two morphological sections (stem + ending) should also be considered.

Indicative Forms

CV + V

	First syllable	Second syllable	Formulae
Close forms:[1]	[i],[a],[o],[u]	[i]	close / CV_1 - y/ɤ ι y ; close / CV_2 - w ι y
Open forms:[2]	[æ],[a],[ɔ],[o]	[e]/[o]	open / CV_1 - ∈ y/ɤ y/w ; open / CV_2 - ∈ w y/w

1. See indicative forms with [-i] on page 345
2. See indicative forms with [-e] and [-o] on page 345.

CV + CV(C)

Close forms:[1] [i], [e], [o], [u]. [i]/[e]/[o]/[a]

$$\frac{\text{close}}{CV_2\text{-}C\,\iota^{y/w}/C\in^{y}/C\alpha C^{y/w}\,\wp}$$

i) $$\frac{\text{close}}{CV_2\text{-}C\,\iota^{y}/C\in^{y}/C\alpha C^{y/w}\,\wp}$$

ii) $$\begin{cases} \dfrac{\text{close}}{CV_1\text{-}C\,\iota^{y}/C\in^{y}/C\alpha C^{y/w}\,\wp} \\[2ex] \dfrac{\text{close}}{CV_1\text{-}C\,\iota^{-y-}/C\in^{y}/C\alpha C^{y/w}\,\wp} \end{cases}$$

Close forms[2] (ii) [i],[a],[o],[u]. [i]/[e]/[o]

$$\frac{\text{close}}{CV_1\text{-}C\,\iota^{y}/C\in^{y/w}\,y/\wp/w}$$

$$\frac{\text{close}}{CV_1\text{-}C\,\iota^{-y-}/C\in^{y}\,y/w}$$

Close forms[3](iii) [i],[a],[o],[u]. [i]/[e]/[o]

$$\frac{\text{close}}{CV_1\,C\,\iota^{g}/C\in^{y}\,y/\wp/w}$$

$$\frac{\text{close}}{CV_1\,C\,\iota^{Y}/C\in^{y}\,y/w}$$

CV + əCV

Close form[4] [i], [e], [o], [u] [e]

$$\frac{\text{close}}{CV_2\text{-}\,\text{ə}C\in^{y}\,y/w}$$

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1. See indicative forms with ending [-li],[-le],[-lo] and [-lam] on page 346-347.
2. See indicative forms with [-bi],[-be] and [-bo] on page 346.
3. See indicative forms with [-chi],[che] and [-cho] on page 346.
4. See indicative forms with [-eche] on page 347.

Imperative forms

Imperative close forms whose ending structure is V, show four vowel alternances in the stem syllable where the ending syllable is mid in ^{w} prosody. The stem syllable has two degrees of openness in ^{y} and ^{w} prosodies. The junction is ^{y} prosodic in forms of all the scatters.

Imperative open forms whose ending structure is -V, show four vowel alternances in the stem syllable where the ending syllable is mid in ^{w} prosody. The stem syllable has two degrees of openness in ^{w} prosody and one degree of openness in each of ^{y} and ^{ɒ} prosodies. The junction is w prosodic in the forms of all the scatters.

These can be formulated thus:

CV + V	first syllable	Second syllable	
close forms:[1]	[i],[e],[o],[u].	[o]	$\frac{\text{close}}{y/w \quad y \quad w}$ $CV_2 - \in$
open forms:[2]	[ɷ], [a], [ɔ], [o]	[o]	$\frac{\text{open}}{y/ɒ \quad w \quad w}$ $CV_1 - \in$
			$\frac{\text{open}}{w \quad w \quad w}$ $CV_2 - \in$

Non-finite forms

Non-finite close forms whose ending structures is -V,

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1. See imperative forms with [-o] (future) on page 348
2. See imperative forms with [-o] (present) on page 348

show four vowel alternances in the stem syllable where the ending syllable is mid in ^{y} prosody. The stem syllable has two degrees of openness in each of ^{y} and ^{w} prosodies. The junction is ^{y} prosodic in forms of all the scatters.

Non-finite open forms whose ending structure is -V or -ɐcshow four vowel alternances in the stem syllable where the ending syllable is open in $^{\wp}$ prosody or mid in ^{w} prosody. The stem syllable has two degrees of openness in ^{w} prosody and one degree of openness in each of ^{y} and $^{\wp}$ prosodies. The junction is ^{w} prosodic in forms of all the scatters.

Non-finite close forms whose ending structure is -CV, show four vowel alternances in the stem syllable where the ending syllable is mid in ^{y} prosody. The stem syllable has two degrees of openness in each of ^{y} and ^{w} prosodies. The junction is ^{y} prosodic in the forms of all the scatters.

These can be formulated thus:

CV +V	First syllable	Second syllable	Formulae
Close forms:[1]	[i],[e],[o],[u]	[e]	$\frac{\text{close}}{y/w \quad y \quad y}$ $CV_2 - \in$
opne forms:[2]	[ɯ],[a],[ɔ],[o]	[a]	$\frac{\text{open}}{y/\wp \quad w \quad \wp}$ $CV_1 - \alpha$
			$\frac{\text{open}}{w \quad w \quad \wp}$ $CV_2 - \alpha$

1. See non-finite forms with [-e] on page 348
2. See non-finite forms with [-a] on page 348

CV + CV

Close forms:[1] [i], [e], [o], [u] [e] close $\overset{y}{CV_2} - \in^{y}$

close $\overset{w}{CV_1} - \in^{y}$

close $\overset{w}{CV_1} - \overset{y}{\in}^{y}$

CV + əC

open forms:[2] [ɯ], [ɑ], [ɔ], [o] [o] open $\overset{y/ɔ}{CV_1} - \overset{w}{əC}$

open $\overset{w}{CV_2} - \overset{w}{əC}$

Indicative forms in simple present tense, 1st person are close form exhibiting four vowel alternances, [i], [a], [o] and [u] in the stem syllable. Forms in simple present tense, 2nd person ordinary grade and 3rd person ordinary and familiar grade are open forms which exhibit four vowels in the stem syllable of forms of different scatters. [ɯ], [a], [ɔ] and [o]. Forms in simple past tense in all persons and grades are close forms exhibiting four vowels in the stem syllable [i], [e] [o] and [u]. Forms in present and past progressive tenses in all persons and grades are close forms exhibiting

1. See non-finite forms with [-le] and [-te] on page 348
2. See non-finite forms with [-on] on page 348

four vowels [i], [a], [o] and [u]. Forms in future tense in all persons and grades are close forms exhibiting four vowels in the stem syllable [i], [a], [o] and [u]. Forms in present and past perfect tenses, in all persons and tenses are close forms exhibiting four vowel alternances in the stem-syllable [i], [e], [o] and [u].

Imperative forms in present tense, 2nd person ordinary grade are open forms exhibiting four vowels [ɷ], [a], [ɔ] and [o] in the stem syllable. Forms in future tense 2nd person ordinary grade are close forms, exhibiting four vowel alternances in the stem syllable [i], [e], [o] and [u].

Non-finite forms with [-e], [-le] and [-te] are close forms which exhibit four vowel alternances in the stem syllable, [i], [e], [o] and [u]. Forms with [-a] and [-on] are close forms exhibiting four vowels [ɷ], [a], [ɔ] and [o] in the stem syllable.

The phonological formulae for the stem and ending syllables of CV- stem structures are set out below in tabulated form.

II. Table of the phonological formulae for the stem and ending syllables of CV- stem structure.

(a) Indicative forms

	C L O S E D F O R M S							OPEN FORMS						
	-V	-CV						-cvc	-əcv	-V				
	[-i]	[-li]	[-le]	[-lo]	[-chi]	[-che]	[-cho]	[-bi]	[-be]	[bo]	[-lam]	[eche]	[-e]	[-o]
	y/w y CV -ι 1				y y CV -Cι 1	y y CV - C∈ 1	y w CV -C∈ 1	y/w y CV_1-Cι	y/w y CV_1-C∈	y/w y CV_1-C∈	y/w ɔ CV_2-CαC	y/w y CV_2-əC	y/w/ y CV_1 -∈	y/w/ y CV_1- ∈
	w y CV_2-ι	y/w y CV_2-Cι	y/w y CV_2-C∈	y/w w CV_2-C∈	w y CV_2-Cι	w y CV_2-C∈	w w CV_2-C∈	w -y- y CV_1-Cι	w -y- y CV_1 -C∈	w -y- y CV_1-C∈			w y CV_1-∈	w y CV_1- ∈
1.	close y y Cι - ι	close y y cι -Cι	close y y cι -C∈	close y w cι -C∈	close y -g- y cι -Cι	close y -g- y cι -C∈	close y -g- w cι -C∈	close y y Cι -Cι	close y w Cι -C∈	close y w Cι-C∈	close y ɔ Cι-CαC	close y y y Cι -əC∈	open y y C - ∈	open y w C - ∈
3.	close w y C∈ - ι	close w y y cє -Cι	close w y y C∈ -C∈	close w w C∈ -C∈	close w -y- y c∈ -Cι	close w -y- y C∈ -C∈	close w -y- w C∈ -C∈	close w y y C∈-Cι	close w y y C∈ -C∈	close w y w C∈ -C∈	close w y ɔ C∈-CαC	close w y y C∈-əC∈	open w y C -∈	open w w C -∈
4.	close w y Cι -ι	close w y Cι -Cι	close w y Cι -C∈	close w w Cι -C∈	close w -g- y Cι -Cι	close w -g- y Cι -C∈	close w g w Cι -C∈	close w y Cι - Cι	close w y Cι -C∈	close w w Cι -C∈	close w ɔ Cι-CαC	close w y y Cι -əC∈	open w y C∈ -∈	open w w C -∈
	ɔ y CV_1-ι	y y CV - Cι	y y CV -Cι	y y CV -Cι	ɔ y CV_1 -Cι	ɔ y CV_1-C∈	ɔ w CV_1-C∈	ɔ y CV_1 -Cι	ɔ y CV_1 -Cι	ɔ y CV_1 -Cι	y ɔ CV -CαC	y -y- CV -əC	ɔ y CV - ∈	ɔ w CV_1- ∈
2.	close ɔ y Cɔ- ι	close y y C∈-Cι	close y y C∈-C∈	close y w C∈-C∈	close -g- y Cɔ-Cι	close -g- y Cɔ- C∈	close -g- w Cɔ-C∈	close ɔ y Cα -Cι	close ɔ y Cα -C∈	close ɔ w c α -C∈	close y ɔ C -CαC	close y y y C -əC∈	open ɔ y Cα - ∈	open ɔ w Cα - ∈
1.	[dii]	[dili]	[dile]	[dilo]	[dicchi]	[dicche]	[diccho]	[dibi]	[dibe]	[dibo]	[dilam]	[dieche]	[dæe]	[dæo]
3.	[boi]	[boyli]	[boyle]	[boylo]	[boichi]	[boiche]	[boicho]	[boybi]	[boybe]	[boybo]	[boylam]	[boyeche]	[bɔe]	[bɔo]
4.	[ʃui]	[ʃuli]	[ʃule]	[ʃulo]	[ʃucchi]	[ʃucche]	[ʃuccho]	[ʃubi]	[ʃube]	[ʃubo]	[ʃulam]	[ʃuyeche]	[ʃoe]	[ʃoo]
2.	[pai]	[peli]	[pele]	[pelo]	[pacchi]	[pacchi]	[paccho]	[pabi]	[pabe]	[pabo]	[pelam]	[peyeche]	[pae]	[pao]

(b) Imperative Forms

(c) Non-finite forms

	Close form	Open form	CLOSE FORM			OPEN FORM	
	-V	-V	-ɛV	-ɛCV		-V	-ɔC
	[-o] future	[-o] present	[-e]	[-le]	[-te]	[-a]	[on]
	$y/w \quad w$ $CV_2-\in$	$y/w/\ w$ $CV_1-\in$	$y/w \quad y$ $CV_2-\in$	$y/w \quad y$ $CV_2-C\in$	$y/w \quad y$ $CV_2-C\in$	$y/w/\ ɔ$ CV_1-a	$y/w/\ ɔ$ CV_1-a
						$w \quad ɔ$ CV_1-a	$w \quad ɔ$ CV_1-a
	close	open	close	close	close	open	open
1.	$y \quad w$ $Cɩ-\in$	$y \quad w$ $Ca-\in$	$y \quad y \quad y$ $Cɩ-\in$	$y \quad y$ $Cɩ-C\in$	$y \quad y$ $Cɩ-C\in$	$y \quad w \quad ɔ$ $Ca-a$	$y \quad w$ $Ca-\in C$
	close	open	close	close	close	open	open
3.	$w \quad y \quad w$ $C\in-\in$	$w \quad w$ $Ca-\in$	$w \quad y \quad y$ $C\in-\in$	$w \quad y \quad y$ $C\in-C\in$	$w \quad y \quad y$ $C\in-C\in$	$w \quad w \quad ɔ$ $Ca-a$	$w \quad w$ $Ca-\in C$
	close	open	close	close	close	open	open
4.	$w \quad y \quad w$ $Cɩ-\in$	$w \quad w$ $C\in-\in$	$w \quad y \quad y$ $Cɩ-\in$	$w \quad y$ $Cɩ-C\in$	$w \quad y$ $Cɩ-C\in$	$w \quad w \quad ɔ$ $C\in-a$	$w \quad w$ $C\in-\in C$
	$y \quad w$ $CV_1-\in$	$ɔ \quad w$ $CV_1-\in$	$y \quad y$ $CV_1-\in$	$y \quad y$ $CV_1-C\in$	$y \quad y$ $CV_1-C\in$	$ɔ \quad ɔ$ CV_1-a	$ɔ \quad w$ $CV_1-\in C$
	close	open	close	close	close	open	open
	$y \quad y \quad w$ $C\in-\in$	$ɔ \quad w$ $Ca-\in$	$y \quad y \quad y$ $C\in-\in$	$y \quad y$ $C\in-C\in$	$y \quad y$ $C\in-C\in$	$ɔ \quad w \quad ɔ$ $Ca-a$	$ɔ \quad w$ $Ca-\in C$
1.	[dio]	[dɷo]	[die]	[dile]	[dite]	[dɷwa]	dɷon
3.	[boyo]	[bɔo]	[boye]	[boyle]	[boyte]	[bɔwa]	bɔon
4.	[ʃuyo]	[ʃoo]	[ʃuye]	[ʃule]	[ʃute]	[ʃowa]	ʃoon
2.	[peyo]	[pao]	[peye]	[pele]	[pete]	[pawa]	[paon]

10.4 CVCə - Stem Structure

(a) Indicative forms

(i) CVCə + V

	[-i] ending	[-e] ending
1.	[e]-[i] [peṭai][1]	[e]-[e] [peṭae][2]
2.	[ɒ]-[i] [khælai]	[æ]-[e] [khælae]
3.	[a]-[i] [kaṭai]	[a]-[e] [kaṭae]
4.	[ɔ]-[i] [bɔlai]	[ɔ]-[e] [bɔlae]
5.	[o]-[i] [tolai]	[o]-[e] [tolae]

[-o] ending

[e]-[o] [peṭao][3]

[æ]-[o] [khælao]

[a]-[o] [kaṭao]

[ɔ]-[o] [bɔlao]

[o]-[o] [tolao]

(ii) CVCə + CV

	[-li] ending[4]	[-le] ending[5]
1.	[e]-[i] [peṭali]	[e]-[e] [peṭale]
2.	[æ]-[i] [khælali]	[æ]-[e] [khælale]
3.	[a]-[i] [kaṭali]	[a]-[e] [kaṭale]
4.	[ɔ]-[i] [bɔlali]	[ɔ]-[e] [bɔlale]
5.	[o]-[i] [tolali]	[o]-[e] [tolale]

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1. Alternative pronunciation is [piṭai]
2. " " " [piṭae]
3. " " " [piṭao]
4. " " " [piṭali]
5. " " " [piṭale]

[-lo] ending

1. [e]-[o] [peʈalo][1]
2. [æ]-[o] [khælalo]
3. [a]-[o] [kaʈalo]
4. [ɔ]-[o] [bɔlalo]
5. [o]-[o] [tolalo]

Forms with [-chi],[-che],[-cho], [bi], [be], and [bo] show similar vowel sequence as those with [-li], [-le], and [-lo].

(iii) CVCə + CVC

[-lam] ending

1. [e]-[a][peʈalam][2]
2. [æ]-[a][khælalam]
3. [a]-[a][kaʈalam]
4. [ɔ]-[a][bɔlalam]
5. [o]-[a][tolalam]

(iv) CVCə + əCV

[-eche] ending

[i]-[e] [piʈieche]
[e]-[e] [khelieche]
[a]-[e] [kaʈieche]
[o]-[e] [bolieche]
[u]-[e] [tulieche]

Forms with endings [-tam] show similar vowel sequences to those with [-lam] ending. Forms with endings [-echi], [-echo], [-echiʃ], [-echen], [-echilam], [-echili], [-echile], [-echilo] and [-echilen] are similar to those with [-eche].

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1. Alternative pronunciation is [piʈalo]
2. " " " [piʈalam]

(b) Imperative Forms [1]

	(i) CVCə + Ø ending	(ii) CVCə + əC [-iʃ] ending	[-uk] ending	
1.	[e]-[a] [peʈa] [2]	[e]-[a][peʈaʃ] [3]	[e]	[peʈak] [4]
2.	[æ]-[a] [khæla]	[æ]-[a][khælaʃ]	[æ]	[khælak]
3.	[a]-[a] [kata]	[a]-[a][kaʈaʃ]	[a]	[kaʈak]
4.	[ɔ]-[a] [bɔla]	[ɔ]-[a][bɔlaʃ]	[ɔ]	[bɔlak]
5.	[o]-[a] [tola]	[o]-[a][tolaʃ]	[o]	[tolak]

Forms with [-un] ending are similar to those with [-uk]

(iii) CVCə + V

	[-o] (Present) ending	[-o] (future) ending
1.	[e]-[o] [peʈao] [5]	[i]-[o] [piʈio]
2.	[æ]-[o] [khælao]	[e]-[o] [khelio]
3.	[a]-[o] [kaʈao]	[a]-[o] [kaʈio]
4.	[ɔ]-[o] [bɔlao]	[o]-[o] [bolio]
5.	[o]-[o] [tolao]	[u]-[o] [tulio]

It will, be seen that the present imperative forms with [-o] are similar to the indicative forms with [-o].

---

1. Imperative forms with Ø , [-iʃ], [-uk] and [-un] do not show any vowel sequence with ending syllable. Phonetic expression of endings are nil in these forms.
2. Alternative pronunciation is [piʈa]
3. " " " [piʈaʃ]
4. " " " [piʈak]
5. " " " [piʈao]

(i) CVCə + V	(ii) CVCə + CV	
[-e] ending	[-le] ending	[-no][1] ending
[i]-[e] [piţie]	[e]-[e] [peţale][2]	[e]-[o] [peţano][3]
[e]-[e] [khelie]	[æ]-[e] [khælale]	[æ]-[o] [khælano]
[a]-[e] [kaţie]	[a]-[e] [kaţale]	[a]-[o] [kaţano]
[ɒ]-[e] [bolie]	[ɔ]-[e] [bɔlale]	[ɔ]-[o] [bɔlano]
[u]-[e] [tulie]	[o]-[e] [tolale]	[o]-[o] [tolano]

Forms with endings [-te] are similar to those with [-le]. Non-finite forms with [-le] and [te] are similar to the indicative forms with [-le] and [te]. Non-finite forms with [-e] show similar vowel sequences to the indicative forms with [-eche] and also imperative forms with [-o] (future).

It will be seen from the examples that all the forms in each of the categories, indicative, imperative and non-finite exhibit two types of vowel alternances in the stem syllable with different endings. Indicative forms with endings, [-i], [-e], [-iʃ], [-li] and [-chi], imperative forms with ∅, [-iʃ], [-uk] and [-o] (Present), and non-finite forms with [-te] and [-no] exhibit five vowels, [e], [æ], [a], [ɔ] and [o] in the stem syllable; and indicative forms with ending [-eche],

1. The ending [-no] occurs only in dissyllabic and trisyllabic forms. See ending structures, Chapter 8.
2. Alternative pronunciation [piţale]
3. Alternative pronunciation [piţano]

imperative forms with [-o] (future) and non-finite forms with [-e] exhibit five different vowels, [i], [e], [a], [o] and [u] in the stem syllable.

Forms that exhibit five vowels [e], [æ], [a], [ɔ] and [o] are open forms and those that exhibit five vowels [i], [e] [a], [o] and [u] in the stem syllable are close forms. In other words, indicative forms with [-i], [-e], [-o], [-iʃ], [-li] and [-eche], imperative forms with ∅, [-iʃ], [-uk] and [-o] (present) and non-finite forms with [-le] and [-no] are open forms; and indicative forms with [-eche], imperative forms with [-o] (future) and non-finite forms with [-e] are close forms. Open forms in CVCə- structure show similar vowel differences to those in CVC- stem structure, and close forms in CVCə- structure show similar vowel differences to those close forms in CVC- stem structure that exhibit five vowel alternances in the stem syllable.

Open forms have two degrees of openness in each of ^{y} and ^{w} prosodic syllables which are never more close than half-close. Close forms have two degrees of openness in each of ^{y} and ^{w} prosodic syllables, which are never more open than between half close and half open. Both open and close forms show vowel [a] in the stem syllable. Vowel qualities observed in different forms are similar to those in open forms and close forms of the CVC- stem structure.

Indicative forms whose ending structure is -əCV are close forms, forms with endings of all other structures are open forms. Imperative forms whose ending structure is -V

are of two types: open and close; and forms with ending of other structures are open forms. Non-finite forms whose ending is -V are close forms, forms with endings of all other structures are open forms, so far as the forms in this extended stem structure CVCə- are concerned.

These can be formulated thus:

Indicative form

(i) CVCə + V

	First syllable	third syllable
Open forms:[1]	[e], [æ], [a], [ɔ], [o].	[i]/[e]/[o]
		$y/w\ CV_2Cə-ɩ^{y}$
		$ɔ\ CV_1Cə-ɩ^{y}$
		$y/w\ CV_2Cə-ɛ^{y/w}$
		$æ\ CV_1Cə-ɛ^{y/w}$

(ii) CVCə + CV(C)

open forms:[2]	[e],[æ], [a], [ɔ], [o]	[i]/[e]/[o]/[a]
		$y/w\ CV_2Cə-\ Cɩ^{y}$
		$ɔ\ CV_1Cə-\ Cɩ^{y}$
		$y/w\ CV_2Cə-C\ɛ^{y/w}$

1. See indicative forms with endings [-i], [-e] and [-o] on p.
2. See indicative forms with endings [-li], [-le], [-lo] and [-lam] on page

$$\overset{\wp}{CV_1C\text{ə-}\ C\in}\ \overset{y/w}{}$$

$$\overset{y/w}{CV_2C\text{ə-}C\alpha C}\ \overset{\wp}{}$$

$$\overset{\wp}{CV_1C\text{ə-}\ C\alpha C}\ \overset{\wp}{}$$

(iii) CVCə-əCV

Close forms [1]: [i], [e], [a], [o], [u]. [e]

$$\overset{y/w}{CV_2C\text{ə-ə}}\ \overset{y}{CV}$$

$$\overset{\wp}{CV_1C\text{ə-ə}}\ \overset{y}{CV}$$

Imperative forms

CVCə + V

close forms: [2] [i], [e], [a], [o], [u]. [o]

$$\overset{y/w}{CV_2C\text{ə}\ -\in}\ \overset{w}{}$$

$$\overset{\wp}{CV_1C\text{ə-}\in}\ \overset{w}{}$$

open forms: [3] [e], [æ], [a], [ɔ], [o] [o]

$$\overset{y/w}{CV_2C\text{ə-}\in}\ \overset{w}{}$$

$$\overset{\wp}{CV_1C\text{ə-}\in}\ \overset{w}{}$$

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1. See indicative forms with [-eche] on page
2. See imperative forms with [-o](future) on page
3. See imperative forms with [-o](present) on page

CVCə + V

close forms:[1] [i], [e], [a], [o], [u] : [e]

$$CV_2C\text{ə} - \in^{y/w}$$

$$CV_1C\text{ə} - \in^{\varnothing}$$

CVCə + CV

•pen forms:[2] [e], [æ], [a], [ɔ], [o] [e]/[o]

$$CV_2C\text{ə} - C\in^{y/w}$$

$$CV\ C\text{ə} - C\in^{\varnothing}$$

It is important to note that so far as the causative verbs in CVCə- stem structure are concerned, indicative forms in present and past perfective tense in all persons and grades are close forms which exhibit five vowel alternances [i], [e], [a], [o] and [u] in the stem syllable of forms in different scatters. Forms in all other tenses, persons and grades are •pen forms which exhibit five vowel alternances in the stem syllable [e], [æ], [a], [ɔ] and [e].

Causative imperative forms in future tense, 2nd person, ordinary grade are close forms which exhibit five different vowels in the stem syllable [i], [e], [a], [o] and [u]

1. See Non-finite forms with [-e] on page
2. See Non-finite forms with [-le] and [-no] on page

Forms in all other tenses, persons and grades are open forms that exhibit five vowels [e], [æ], [a], [ɔ], and [o].

Causative Non-finite forms with [-e] are close forms which exhibit five vowels in the stem syllable, [i], [e], [a], [o], [u]. All other non-finite forms are open forms which exhibit five vowels in the stem syllable, [e], [æ], [a], [ɔ] and [o].

Table of the phonological formulae for the stem ending syllables of CVCə- stem structures

(a) Indicative forms

	Close forms	OPEN FORMS						
	-əC∈	V				CV		-CVC
	[-əche] ending	[-i] ending	[-e] ending	[-o] ending	[-li] ending	[-le] ending	[-lo] ending	[-lam] ending
	y/w CV_2C-əC∈ y	y/w CV_2C-ι y	y/w CV_2C-∈ y	y/w CV_2C-∈ w	y/w CV_2C-Cι y	y/w CV_2C-C∈ w	Y/w CV_2C-C∈ w	y/w $CV_2Cə$-CαC
1.	close y y y Cι Cə-əC∈	open y ɔ y C∈Cə-ι	open y ɔ y C∈Cə-∈	open y ɔ w C∈Cə-∈	open y ɔ y C∈Cə-Cι	open y ɔ y C∈Cə-C∈	open y ɔ w C∈Cə- C∈	open y ɔ ɔ C∈Cə-CαC
2.	close y y y C∈Cə- C∈	open y ɔ y CαCə- ι	open y ɔ y CαCə- ∈	open y ɔ w CαCə- ∈	open y ɔ y CαCə- Cι	open y ɔ y CαCə-C∈	open y ɔ w CαCə-C∈	open y ɔ ɔ CαCə-CαC
4.	close w y y C∈Cə- C∈	open w ɔ y CαCə- ι	open w ɔ y CαCə- ∈	open w ɔ w CαCə -∈	open w ɔ y CαCə- Cι	open w ɔ y CαCə-C∈	open w ɔ w CαCə-C∈	open w ɔ ɔ CαCə- CαC
5.	close w y y Cι Cə- əC∈	open w ɔ y C∈Cə- ι	open w ɔ y C∈Cə- ∈	open w ɔ w C∈Cə- ∈	open w ɔ y C∈Cə-Cι	open w ɔ y C∈Cə- C∈	open w ɔ w C∈Cə- C∈	open w ɔ ɔ C∈Cə-CαC
	ɔ CV_1C-əC∈ y	ɔ ɔ y CV_1C- ι	ɔ y CV_1C- ∈	ɔ w CV_1C-∈	ɔ ɔ y CV_1C-Cι	ɔ y CV_1C-C∈	w CV_1C-C∈	ɔ ɔ CV_1C-CαC
3.	close w y y CαCə-əC∈	open α α y CαCə- ι	open α α y CαCə-∈	open α α w CαCə- ∈	open α α y CαCə-Cι	ɔ open ɔ ɔ y CαCə- C∈	ɔ open ɔ ɔ w CαCə- C∈	ɔ open ɔ ɔ ɔ CαCə-CαC
1.	[piţieche]	[peţai]	[peţae]	[peţao]	[peţali]	[peţale]	[peţalo]	[peţalam]
2.	[kheliechi]	[khælai]	[khælae]	[khælao]	[khælali]	[khælale]	[khælalo]	[khælalam]
4.	[boliechi]	[bɔlai]	[bɔlae]	[bɔlao]	[bɔlali]	[bɔlale]	[bɔlalo]	[bɔlalam]
5.	[tuliechi]	[tolai]	[tolae]	[tolao]	[tolali]	[tolale]	[tolalo]	[tolalam]
3.	[kaţiechi]	[kaţai]	[kaţae]	[kaţao]	[kaţali]	[kaţale]	[kaţalo]	[kaţalam]

(b) Imperative (c) Non-finite

	Close Form	Open Forms	Close Form	O P E N F O R M S		
	V	V	V	CV		
	[-o] Future ending	[-o] Present ending	[-e] ending	[-te] ending	[-le] ending	[-no] ending
	y/w y w $CV_2C\text{ə}-\in$	y/w ɔ w $CV_2C\text{ə}-\in$	y/w y y $CV_2C\text{ə}-\in$	y/w ɔ y $CV_2C\text{ə}-C\in$	y/w ɔ y $CV_2C\text{ə}-C\in$	ɔ w $CV_2C\text{ə}-C\in$
1.	close y y w $C\iota C\text{ə}-\in$	open y ɔ w $C\in C\text{ə}-\in$	close y y y $C\iota C\text{ə}-\in$	open y ɔ y $C^{\in}C\text{ə}-C\in$	open y ɔ y $C\in C\text{ə}-C\in$	open y ɔ w $C\in C\text{ə}-C\in$
2.	close y y w $C\in C\text{ə}-\in$	open y ɔ w $C\alpha C\text{ə}-\in$	close y y y $C\in C\text{ə}-\in$	open y ɔ y $C^{\alpha}C\text{ə}-C\in$	open y ɔ y $C\alpha C\text{ə}-C\in$	open y ɔ w $C\alpha C\text{ə}-C\in$
4.	close w y w $C\in C\text{ə}-\in$	open w ɔ w $C\alpha C\text{ə}-\in$	close w y y $C\in C\text{ə}-\in$	open w ɔ w $C\alpha C\text{ə}-C\in$	open w ɔ y $C\alpha C\text{ə}-C\in$	open w ɔ w $C\alpha C\text{ə}-C\in$
5.	close w y w $C\iota C\text{ə}-\in$	open w ɔ w $C\in C\text{ə}-\in$	close w y y $C\iota C\text{ə}-\in$	open w ɔ y $C\in C\text{ə}-C\in$	open w ɔ y $C^{\in}C\text{ə}-C\in$	open w ɔ w $C\in C\text{ə}-C\in$
	ɔ y w $CV_1C\text{ə}-\in$	ɔ ɔ w $CV_1C\text{ə}-\in$	ɔ y y $CV_1C\text{ə}-\in$	ɔ ɔ y $CV_1C\text{ə}-C\in$	ɔ ɔ y $CV_1C\text{ə}-C\in$	ɔ ɔ w $CV_1C\text{ə}-C\in$
3	ɔ close y w $C\alpha C\text{ə}-\in$	ɔ open ɔ w $C\alpha C\text{ə}-\in$	ɔ close y y $C\alpha C\text{ə}-\in$	ɔ open ɔ y $C\alpha C\text{ə}-C\in$	ɔ open ɔ y $C\alpha C\text{ə}-C\in$	ɔ open ɔ w $C\alpha C\text{ə}-C\in$
1	[piţio]	[peţao]	[piţie]	[peţate]	[peţale]	[peţano]
2.	[khelio]	[khælao]	[khelie]	[khælate]	[khælale]	[khælano]
4.	[bolio]	[bɔlao]	[bolie]	[bɔlate]	[bɔlale]	[bɔlano]
5.	[tulio]	[tolao]	[tulie]	[tolate]	[tolale]	[tolano]
3	[kaţio]	[kaţao]	[kaţie]	[kaţate]	[kaţale]	[kaţano]

10.5 CVə- Stem Structure.[1]

Unlike CV- stem structure, forms in CVə- stem structure show five vowel alternances with different endings. It has been already stated (upra) that in some categories the forms in stem structure CV- involve y or w prosody in the stem and ending junction. Forms in the stem structure CVə- involve y or w prosody in the linking of the two syllables of the stem. In addition, where the ending begins with [-ch-] forms in stem structure CVə- , like those in stem structure CV-, involve g prosody in the stem and junction.

The following forms in this structure with different endings are given for example.

(a) Indicative forms

(i) CVə + V

..	[-i] ending.	[-e] ending.[2]	[-o] ending.
1.	[i]-[i] [jiai][3]	[i]-[e] [jiae][4]	[i]-[o] [jiao][5]
2.	[œ]-[i] [dœwai]	[œ]-[e] [dœwae]	[œ]-[o] [dœwao]
3.	[a]-[i] [pawai]	[a]-[e] [pawae]	[a]-[o] [pawao]
4.	[ɔ]-[i] [bɔwai]	[ɔ]-[e] [bɔwae]	[ɔ]-[o] [bɔwao]
5.	[o]-[i] [ʃowai]	[o]-[e] [ʃowae]	[o]-[o] [ʃowao]

---

1. So far as the vowel harmony is concerned, forms of VCə- stem structure do not show peculiarities other than those mentioned in connection with the forms of CVCə- stem structures. Hence they are not exemplified.
2. Forms with [-en] do not show any vowel sequence. Their phonetic expressions are similar to the stem syllable of the forms in [-e] ending. e.g. [jian], [dœwan], [pawan],[bɔwan] [ʃowan]. Phonetic realization of ə in -əe ending is nil in the forms of this structure.
3. Alternative form is [jiui].
3. Alternative form is [jioe].
4. Alternative form is [jioo].

(ii) CVə + CV

	[-li] ending	[-le] ending	[-lo] ending
1.	[i]-[i] [jiali][1]	[i]-[i] [jiale][2]	[i]-[o] [jialo][3]
2.	[æ]-[i] [dæwali]	[æ]-[i] [dæwale]	[ ]-[o] [dæwalo]
3.	[a]-[i] [pawali]	[a]-[i] [pawale]	[a]-[o] [pawalo]
4.	[ɔ]-[i] [bɔwali]	[ɔ]-[i] [bɔwale]	[ɔ]-[o] [bɔwalo]
5.	[o]-[i] [ʃowali]	[o]-[i] [ʃowale]	[o]-[o] [ʃowalo]

Forms with [-chi], [-che][4], [-cho], [-bi], [-be], [-bo] are similar to those with [-li]. [-le] and [-lo].

(iii) CVə + CVC

	[-lam] ending
1.	[i]-[a] [jialam][5]
2.	[æ]-[a] [dæwalam]
3.	[a]-[a] [pawalam]
4.	[ɔ]-[a] [bɔwalam]
5.	[o]-[a] [ʃowalam]

(iv) CVə + əCV

	[-eche] ending
1.	[i]-[e] [jiyieche]
2.	[i]-[e] [diyieche]
3.	[a]-[e] [payieche]
4.	[o]-[e] [boyieche]
5.	[u]-[e] [ʃuyeche]

Forms with [-tam] are similar to those with [-lam]; Forms with endings [-echi], [-echo], [-echen], [-echili], [-echile], [-echilo] [-echilen] and [-echilam] are similar to those with [-eche].

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1. Alternative form is [jioli]
2. Alternative form is [jiole]
3. Alternative form is [jiolo]
4. The junction of stem and ending is geminated in the forms of this structure with endings beginning with [-che]. e.g. [jiacchi], [dæwacchi], [pawacchi], [bɔwacchi] and [ʃowachi] etc. But this does not affect the vowel harmony relation.
5. Alternative form is [jiolam].

(b) Imperative forms

(i) CVə + Ø ending	(ii) CVə + əC ending	
[i] [jia] [1]	[-iʃ] ending	[-uk] ending
[dæwa]	[jiaʃ] [2]	[jiak] [3]
[pawa]	[dæwaʃ]	[dæwak]
[bɔwa]	[pawaʃ]	[pawak]
[ʃowa]	[bɔwaʃ]	[bɔwak]
	[ʃowaʃ]	[ʃowak]

Forms with [-un] are similar to those with [-uk].

(iii) CVə + V

[-o] (Present) ending	[-o] (future) ending
[jiao] [4]	[jiyio]
[dæwao]	[diyio]
[pawao]	[payio]
[bɔwao]	[boyio]
[ʃowao]	[ʃuyio]

Imperative forms with [-o] (present) are similar to the indicative forms with [-o].

---

1. Alternative pronunciation is [jio]
2. Alternative pronunciation is [jioʃ]
3. Alternative pronunciation is [jiuk]
4. Alternative pronunciation is [jioo]

(C) Non-finite forms

(i) CVə + V	(ii) CVə + CV	(iii) CVCə + CV
[-e] ending	[-le] ending	[-no] ending
[i]-[e] [jiyie]	[i]-[e] [jiale][1]	[i]-[o] [jiano][2]
[i]-[e] [diyie]	[æ]-[e] [dæwale]	[æ]-[o] [dæwano]
[a]-[e] [payie]	[a]-[e] [pawale]	[a]-[o] [pawano]
[o]-[e] [boyie]	[ɔ]-[e] [bɔwale]	[ɔ]-[o] [bɔwano]
[u]-[e] [ʃuyie]	[o]-[e] [ʃowale]	[o]-[o] [ʃowano]

Forms with [-te] are similar to those with [-le]. Non-finite forms with [-le] and [-te] are similar to the indicative forms with [-le] and [te] respectively. Non-finite forms with [-e] show similar vowel sequences to the indicative forms with [-eche]. Imperative forms with [-o] (future) have the same vowel alternances.

It will be seen from the examples that like CVCə- stem-structure, all the forms in each of the groups, indicative, imperative and non-finite exhibit two categories of vowel alternances in the stem syllable with different endings. Indicative forms with endings [-i], [-e], [-o], [-le], [-lam] imperative forms with ∅, [-iʃ], [-uk] and [-o] (present), and non-finite forms in [-le] and [-no] show five vowels, [i], [æ] [a], [ɔ] and [o] in the stem syllable; and indicative forms with [-eche]; imperative forms with [-o] future and non-finite

1. Alternative pronunciation is [jiole]
2. Alternative pronunciation is [jiono]

forms with [-e] exhibit four different vowels, [i], [a], [o] and [u] in the stem syllable.

Forms that exhibit five vowels [i], [æ], [a], [ɔ], and [o] are open forms and those that exhibit four vowels [i], [a], [o] and [u] are close forms. That is, indicative forms with ending structure whose initial element is e are close forms: indicative forms with other ending structures are all open forms. Imperative forms with [-o] future are close forms. Imperative forms with endings of other structures are open forms. Non-finite forms with ending [-e] are close forms, forms with endings of all other structures are open forms.

Open forms in CV- stem structures show four vowel alternances in the stem syllable, and open forms in CVe- stem structure show five vowel alternances, prosody of the linking of the two stem syllables ~~are~~ being always ^{w}. Close forms in CV- stem structure show two categories of vowel alternances: those exhibiting [i], [a], [o], [u] (with different junction prosodies), and those exhibiting [i], [e], [o] and [u] (with different junction prosodies), but the close forms in CVe- stem structures show four vowel alternances, [i], [a], [o], [u] in the stem syllable of forms of different scatters. Linking of the two stem syllables in close forms of CVe- structure is always ^{y} prosodic. This is one of the remarkable distinctions between the close forms and open forms of this stem structure, that the close forms always involve a ^{y} prosody in the linking of the two stem syllables, whereas open forms always involve a ^{w} prosody in the linking of the two stem-syllables.

The Maximum degree of closeness in the stem syllable of open forms is between close and half-close in ^{y} prosodic syllable and between half-close and half-open in ^{w} prosodic syllable.

The maximum degree of openness in the stem syllable of close forms is between close and half-close in ^{y} prosodic syllable and between half-close and half-open in ^{w} prosodic syllable.

Both the close forms and open forms exhibit [a] in the stem syllable. This is in marked contrast with some of the close forms in CVC and CV- stem structures where four vowel alternances are exhibited in the stem syllable and [a] is not shown.

The qualities of the vocalic articulations in the stem syllables are similar to those mentioned in the close forms or open forms of CVC- or CV- stem structures.

These can be formulated thus:

(a) Indicative forms

CVe + V	First syllable	third syllable
open forms:[1]	[i], [æ], [a], [ɔ], [o]	[i]/[e]/[o]
	CV_2 e-	$^{y/w}\ ^{-w-}\ ^{y/}\iota/\epsilon\ ^{y/w}$
	CV_1e -	$^{\circ}\ ^{-w-}\ ^{y/}\iota/\epsilon\ ^{y/w}$

1. See indicative forms with [-i], [-e], [-o] on page 381.

CVə + CV(C)

open forms [1]

[i], [æ], [a], [ɔ], [o] [i]/[e]/[o]/[a]

$CV_2^{y/w}$ ə - C ι ^{w} /C∈ ^{y} /CαC $^{y/w}$

$CV_1^{ɔ}$ ə - C ι ^{w} /C∈ ^{y} /CαC ^{ɔ}

CVə + əCV

Close forms : [2] [i], [a], [o], [u] [-e]

$CV_1^{y/ɔ}$ -w--y- ə - ə C∈ ^{y}

CV_2^{w} -w-y- ə- ə C∈ ^{y}

(b)

Imperative forms

CVə + V

open forms: [3] [i], [æ], [a], [ɔ], [o] [o]

$CV_2^{y/w}$ -w- ə - ∈ ^{w}

$CV_1^{ɔ}$ -w- ə - ∈ ^{w}

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1. See indicative forms with [-li], [-le], [-lo], and [-lam] on p. 382.
2. See indicative forms with [-eche] on page 382.
3. See imperative forms with [-o] (present) on page 383.

Close forms:[1] [i], [a], [ɔ], [u] [o]

y/ɒ w w
CV1 ə - ∈

w w w
CV2 ə- ∈

(c) Non-finite forms

CVə + V

Close forms: [2] [i], [a], [ɔ], [u] [e]

y/ɒ w y
CV1 ə - ∈

w w y
CV2 ə- ∈

CVə + CV

open forms:[3] [i], [æ], [a], [ɔ], [o] [e]/[o]

y/w y/w
CV2ə - C∈

ɒ y/w
CV1ə - C∈

Causative indicative forms in present and past perfective tenses in all persons and grades are close forms. They exhibit four vowel alternances in stem syllable of forms of different scatters. [i], [a], [o] and [u]. Forms in all other tenses, persons and grades are open forms which exhibit five vowel alternances in stem syllable [i, [æ], [a], [ɔ] [o].

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1. See imperative forms with [-o](future) on page 383
2. See Non-finite forms with [-e] on page 384
3. See Non-finite forms with [-le] and [-no] on page 384

Causative imperative forms in future tense, 2nd person ordinary grade are close forms exhibiting four vowel alternances [i], [a], [ɔ] and [u] in the stem syllable of different forms. Forms in other tenses and persons and grades are open forms which exhibit five vowels [i], [æ], [a], [ɔ] and [o] in the stem syllable.

Causative Non-finite forms with ending [-e] are close forms exhibiting four vowels in the stem syllable, [i], [a] [o] and [u]. Non-finite forms with other endings are open forms exhibiting [i], [æ], [a], [ɔ] and [o] in the stem syllable.

Table of the Phonological formulae for the stem and ending syllables of CVə stem structure.

(a) Indicative forms

	Close forms	O P E N F O R M S						
	- əCV	- V			- CV			- CVC
	[-eche]	[-i]	[-e]	[-o]	[-li]	[-le]	[-lo]	[-lam]
	y/w y CV_1ə-əC∈ w y CVə-əC∈	y/w y CV_2ə-ι	y/w y CV_2ə-∈	y/w w CV_2ə-∈	y/w y CV_2ə-Cι	y/w y CV_2ə-C∈	y/w w CV_2ə-C∈	y/w ϰ CV_2ə-CαC
1.	close y y y Cιə-əC∈	open y y Cιə-ι	open y y Cιə-∈	open y w Cιə-∈	open y y Cιə-Cι	open y y Cιə-C∈	open y w Cιə-C∈	open y ϰ Cιə-CαC
2.	close y y y Cιə-əC∈	open y y Cαə-ι	open y w Cαə-∈	open y w Cαə-∈	open y w y Cαə-Cι	open y w y Cαə-C∈	open y w w cαə-C∈	open y w ϰ Cαə-CαC
4.	close w y y Cιə-əC∈	open w w y Cαə-ι	open w w y Cαə-∈	open w w w Cαə-∈	open w w y Cαə-Cι	open w w y Cαə-C∈	open w w w C αə-C∈	open w w ϰ Cαə-CαC
5.	close w y y Cιə-əC∈	open w w y C∈ə-ι	open w w y C∈ə-∈	open w w w C∈ə-∈	open w w y C∈ə-Cι	open w w y C∈ə-C∈	open w w w C∈ə-C∈	open w w ϰ C∈ə-CαC
	ϰ y CV_1ə-əC∈	ϰ y CV_1ə-ι	ϰ y CV_1ə-∈	ϰ w CV_1ə-∈	ϰ y CV_1ə-Cι	ϰ y CV_1ə-C∈	ϰ w CV_1ə-C∈	ϰ ϰ CV_1ə-CαC
3.	close ϰ y y Cαə-əC	open ϰ w y Cαə-ι	open ϰ w y Cα ə-∈	open ϰ w w C α ə-	open ϰ w y Cαə-C	open ϰ w y Cαə-C	open ϰ w y Cαə-C	open ϰ w ϰ Cαə-CαC

1.[jiyieche][jiai] [jiae] [jiao] [jiali] [jiale] [ʃialo] [j

2.[diyieche][dæwai][dæwae][dæwao][dewali][dæwale] [dæwalo] [

4.[boyeche] [bɔwai][bɔwae][bɔwao][bɔwali][bɔwale] [bɔwalo] [

5.[ʃuyeche] [ʃowai][ʃowae][ʃowao][ʃowali][ʃowale] [ʃowalo] [

3.[payieche][pawai][pawae][pawao][pawali][pawale] [pawalo] [

(b) Imperative forms

(c) Non-finite forms

Close forms	Open forms	close forms	O P E N F O R M S		
[-o](future) ending	[-o](pres) ending	[-e] ending	[-le] ending	[-te] ending	[-no] ending
y/w w w CV_1ə-∈ w w CV_1ə-∈	y/w w w CV_1ə-∈	y/w w y CV_1ə-∈	y/w w y CV_1ə-C∈	y/w w y CV_1ə-C∈	y/w w w CV_1ə-C∈
close y y w Cɩ ə-∈ close y y w Cɩ ə-∈ close w y w C∈ ə-∈ close w y w Cɩə- ∈ y w CV_1ə-∈	open y w w Cɩ ə-∈ open y w w Cα ə-∈ open w w w Cα ə-∈ open w w w C∈ə- ∈ ɔ w w CV_1ə-∈	close y y y Cɩ ə-∈ close y y y Cɩ ə-∈ close w y y C∈ ə-∈ close w y y Cɩə- ∈ ɔ w y CV_1ə-∈	open y w y Cɩ ə-C∈ open y w y Cα ə-C∈ open w w y Cα ə-C∈ open w w y C∈ə- C∈ ɔ w y CV_1ə-C∈	open y w y Cɩə-C∈ open y w y Cα ə-C∈ open w w y Cα ə-C∈ open w w y C∈ə-C∈ ɔ w y CV_1ə-C∈	open y w w Cɩə-C∈ open y w w C α ə-C∈ open w w w Cα ə-C∈ open w w w C∈ə- C∈ ɔ w w CV_1ə-C∈
close ɔ y w Cα ə-∈	open ɔ w w Cα ə-∈	close ɔ y y Cα ə-∈	open ɔ w y Cα ə-C∈	open ɔ w y Cα ə-C∈	open ɔ w w C α ə-C∈
[jiyio]	[jiao]	[jiyie]	[jàdle]	[jiate]	[jiano]
[diyio]	[dæwao]	[diyie]	[dæwale]	[dæwate]	[dæwano]
[boyio]	[bɔwao]	[boyie]	[bɔwale]	[bɔwate]	[bɔwano]
[ʃuyio]	[ʃowao]	[ʃuyie]	[ʃowale]	[ʃowate]	[ʃowano]
[payio]	[pawao]	[payie]	[pawale]	[pawate]	[pawano]

Forms in stem structures VCə-, CV͡CCə-, V͡CCə- and CVC/CVCə do not show peculiarities other than those mentioned in connection with the vowel harmony of the forms of CVCə- stem structure. The statement made for the forms in CVCə- stem structure is valid for the forms in these structures. Similar relation of close forms and open forms are found with different ending structures to those in structure CVCə-, except that the open forms in CVCə- stem structures show five vowel alternances [e], [æ], [a], [ɔ], and [o], whereas open forms in stem structure (C)V͡CCə- show five vowel alternances [i], [æ] [a], [ɔ] and [o]. In this respect these open forms show similar vowel differences as the forms in CVC- stem structure with ending [-lam] . In all other respects open forms and close forms of these stem structures are similar to those in CVCə- stem structure. At the grammatical level forms in stem structures CVC-, Vc and CV are non-causative forms. Forms in extended stem structures CVCə-, VCə- and CVə- are referred to as causative forms. Forms of the stem structures CV͡CCə- and V͡CCə- and CVC/CVCə- are different from the forms of monosyllabic non extended (radical) stem structures and dissyllabic extended stem structures in that the forms of monosyllabic stem structures are always non-causative and forms of dissyllabic extended stem structures are always causative verbs. Forms of the dissyllabic stem structure CV͡CCə- and V͡CCə- and trisyllabic stem structure CVC/CVCə function both as non-causative and causative.

Indicative forms, causative and non-causative, as the case may be, in the stem structures (C)VCCə- and CVC/CVCə- in present and past perfect tenses in all persons and grades are close forms which exhibit five vowel alternances [i], [e], [a] [o] and [u] in the stem syllable of the forms in different scatters. Indicative forms in all other tenses, persons and grades are open forms which exhibit five vowel alternances [i], [æ], [a], [ɔ] and [u].

Imperative forms in these stem structures in future tense, 2nd person, ordinary grade are close forms which exhibit same five vowel alternances in the stem syllable as in the case of indicative close forms. Imperative forms in all other tenses, persons and grades are open forms that exhibit five vowel alternances in the stem syllable of different forms as in the case of indicative open forms in these structures.

Non-finite forms in these stem structures with ending [-e] are close forms. All other non-finite forms are open forms. Non-finite close forms and open forms exhibit similar vowel alternances to those in indicative or imperative forms in these structures.

It will be seen from the examples in different structures that unlike forms in CVC-, VC and CV stem structures, forms in CVCə-, VCə-, CVə-, CVC͡Cə- and CVC/CVCə- stem structures have only one category of close forms and one category of open forms.

Some forms of stem structure CV$\widehat{\text{CC}}$ə-[1] with different endings[2] are given below for examples.

10.6 CV$\widehat{\text{CC}}$ə sten structure

(a) Indicative forms

(1) CV$\widehat{\text{CC}}$ə + V

[-i] ending		[-e] ending	
[i]-[i]	[cimʈai]	[i]-[e]	[cimʈae]
[æ]-[i]	[bhæɲcai]	[æ]-[e]	[bhæɲcae]
[a]-[i]	[palʈai]	[a]-[e]	[palʈae]
[ɔ]-[i]	[pɔstai]	[ɔ]-[e]	[pɔstae]
[o]-[i]	[ʈhokrai]	[o]-[e]	[ʈhokrae]

[-o] ending		(ii) CV$\widehat{\text{CC}}$ə + əCV [-eche] ending	
[i]-[o]	[cimʈao]	[i]-[e]	[cimʈieche]
[æ]-[o]	[bhæɲcao]	[e]-[e]	[bheɲcieche]
[a]-[o]	[palʈao]	[a]-[e]	[palʈieche]
[ɔ]-[o]	[pɔstao]	[o]-[e]	[pɔstieche]
[o]-[o]	[ʈhokrao]	[u]-[e]	[ʈhukrieche]

---

1. As the forms of the stem structures V$\widehat{\text{CC}}$ə- do not show any difference in the vowel sequences of the stem syllable one and ending syllable, they will not be examplified. The statement about the forms of CV$\widehat{\text{CC}}$ə- structure will hold good for the forms in this structure as well. For the same reason examples of reduplicated forms in CVC/CV$\widehat{\text{CC}}$ə- stem structure are not given.
2. Indicative forms with [-i], [-e], [-o] and [-eche] imperative forms with [-o] present and [-o] future non-finite forms with [-e] and [-no] are given here as representative.

(b) Imperative forms

(i) $\widehat{CVCC}$ə + V

[-o] (present) ending		[-o] (future) ending	
[i]-[o]	[cimʈao]	[i]-[e]	[cimʈie]
[æ]-[o]	[bhæŋcao]	[e]-[e]	[bheŋcie]
[a]-[o]	[palʈao]	[a]-[e]	[palʈie]
[ɔ]-[o]	[pɔstao]	[o]-[e]	[pɔstie]
[o]-[o]	[ʈhokrao]	[u]-[e]	[ʈhukrie]

(c) Non-finite forms

$\widehat{CVCC}$ə + V

[-e] ending		[-no] ending	
[i]-[e]	[cimʈie]	[i]-[o]	[cimʈano]
[e]-[e]	[bheŋcie]	[æ]-[o]	[bheŋcano]
[a]-[e]	[palʈie]	[a]-[o]	[palʈano]
[o]-[e]	[postie]	[ɔ]-[o]	[pɔstano]
[u]-[e]	[ʈhukrie]	[o]-[o]	[ʈhokrano]

It will be seen from the examples above that indicative forms with [-i], [-e] and [-o] show five vowel alternances in the stem syllable, [i], [æ], [a], [ɔ] and [o]; and indicative forms with [-eche] ending exhibit five vowel alternances, [i], [e] [a], [o] and [u] in the stem syllable. Indicative forms with [-i], [-e], and [-a] are open forms and forms with [-eche] are close forms.

Imperative forms with [-o](present) exhibit same five

vowel alternances in the stem syllable as the indicative open forms stated above, and imperative forms with [-o](future) show same five vowel differences in the stem syllable as the indicative close forms. Imperative forms with [-o] (Present) are open forms and with [-o] future are close forms.

Non-finite forms with [-e] show same five vowel alternances in the stem syllable as the indicative and imperative close forms in this structure, and non-finite forms with [-on] exhibit same five vowel alternances as the indicative and imperative open forms. Non-finite forms with [-e] are close forms and those with [-on] are open forms.

Open forms have two degrees of openness in each of ^{y} and ^{w} prosodic syllables and one degree in $^{\wp}$ prosodic syllable. Close forms have two degrees of openness in each ^{y} and ^{w} prosodic syllables which are never more open than between half-close and half-open; and one degree of openness in $^{\wp}$ prosodic syllable.

This can be formulated thus:

(a) Indicative forms

	First syllable	Third syllable
open forms.[1]	[i], [æ], [a], [ɔ], [o]	[i]/[e]/[o]
	$^{y/w/\wp}CV_2\widehat{C}C\text{ə}-$	$^{y}\iota/\in\ ^{y/w}$
	$^{\wp}CV_1\widehat{C}C\text{ə}-$	$^{y}\iota/\in\ ^{y/w}$

1. See indicative forms with endings [-i] [-e], and [-o] on p.395

close forms:[1] [i], [e], [a], [o], [u] [e]

$$y/w\ CV_2\widehat{CC}\text{ə-}\ \text{-y-}\ \text{əC}\in\ y$$

$$\wp\ CV_1\widehat{CC}\text{ə-}\ \text{-y-}\ \text{əC}\in\ y$$

(b) Imperative forms:

close forms:[2] [i], [e], [a], [o], [u] [o]

$$y/w\ CV_2\widehat{CC}\text{ə-}\ \text{-y-}\ \text{əC}\in\ w$$

$$\wp\ CV_1\widehat{CC}\text{ə-}\ \text{-y-}\ \text{əC}\in\ w$$

open forms:[3] [i], [æ], [a], [ɔ], [o] [o]

$$y/w/\wp\ CV_2\widehat{CC}\text{ə-}\ \in\ w$$

$$\wp\ CV_1\widehat{CC}\text{ə-}\ \in\ w$$

(c) Non-finite forms

Close forms:[4] [i], [e], [a], [o], [u] [e]

$$y/w\ CV_2\widehat{CC}\text{ə-}\in\ w$$

$$\wp\ CV_1\widehat{CC}\text{ə-}\in\ w$$

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1. See indicative forms with [-eche] on page 395
2. See imperative forms with [-o] (future) on page 396
3. See imperative forms with [-o] (Present) on page 396
4. See Non-finite forms with [-e] on page 396

open forms:[1] [i], [æ], [a], [ɔ], [u] [o]

$$\overset{y/w}{CV_2\widehat{CC}\text{ə-}C\in}\ \overset{w}{}$$

$$\overset{ɔ}{CV_1\widehat{CC}\text{ə-}C\in}\ \overset{w}{}$$

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1. See Non-finite forms with [-no] on page 396

Table of Phonological formulae for the stem and ending syllables of CVCCə- stem structure.

(a)
Indicative forms[1]

	O P E N F O R M S			Close Forms
	V			-əCV
	[-i] ending	[-e]ending	[-o] ending	[-eche] ending
	$y/w\ \widehat{CV\ CCə-}\ y$ $\varnothing\ \widehat{CV_1 CCə-ι}\ y$	$y/w/\varnothing\ \widehat{CV\ CCə-}\ y$ $\varnothing\ \widehat{CV_1 CCə-\in}\ y$	$y/w/\varnothing\ \widehat{CV\ CCə-}$ $\varnothing\ \widehat{CV_1 CCə-}$	$y/w\ \widehat{CV\ CCə-}\ -y-\ CV_2 CCə-əC\in$ $\varnothing\ \widehat{CV_1 CCə-əC\in}$
1.	$y\ \widehat{Cι CCə-ι}\ y$	$y\ \widehat{Cι CCə-\in}\ y$	$y\ \widehat{Cι CCə-\in}\ w$	$y\ \widehat{Cι CCə-}\ -y-\ Cι CCə-əC\in$
2.	$y\ \widehat{Cα CCə-ι}\ y$	$y\ \widehat{Cα CCə-\in}\ y$	$y\ \widehat{Cα CCə-\in}\ w$	$y\ \widehat{C\in CCə-}\ -y-\ C\in CCə-əC\in$
3.	$\widehat{Cα CCə-ι}\ y$	$\widehat{Cα CCə-\in}\ y$	$\varnothing\ \widehat{Cα CCə-\in}\ w$	$\varnothing\ \widehat{Cα CCə-}\ -y-\ Cα CCə-əC\in$
4.	$w\ \widehat{Cα CCə-ι}\ y$	$\widehat{Cα CCə-\in}\ y$	$\varnothing\ \widehat{Cα CCə-\in}\ w$	$w\ \widehat{C\in CCə-}\ -y-\ C\in CCə-əC\in$
5.	$w\ \widehat{C\in CCə-ι}\ y$	$w\ \widehat{C\in CCə-\in}\ y$	$w\ \widehat{C\in CCə-\in}\ w$	$w\ \widehat{Cι CCə-}\ -y-\ Cι CCə-əC\in$
1.	[cimʈai]	[cimʈae]	[cimʈao]	[cimʈieche]
2.	[bhæŋcai]	[bhæŋcae]	[bhæŋcao]	[bheŋeieche]
3.	[palʈai]	[palʈae]	[palʈao]	[palʈieche]
4.	[pɔstai]	[pɔstae]	[pɔstao]	[postieche]
5.	[ʈhokrai]	[ʈhokrae]	[ʈhokrao]	[ʈhukrieche]

1. It will be seen that forms and formulae of the verbs of No.3 are not shown separately as was done in the case of other structures.

(b) Imperative forms

(c) Non-finite forms

OPEN FORMS	CLOSE FORMS	OPEN FORMS	CLOSE FORMS
V	V	CV	V
[-o](present)	[-o](future)	[-no]ending	[-e]ending
y/w/ɔ $CV_1\widehat{CC}ə-\in$ w	y/w $CV_2\widehat{CC}ə-\in$	y/w/ɔ $CV_1\widehat{CC}ə-C\in$ w	y/w $CV_2\widehat{CC}ə-\in$ y
y $CV_1\widehat{CC}ə-\in$ w	ɔ $CV_1\widehat{CC}ə-\in$ w	y $CV_1\widehat{CC}ə-C\in$ w	$CV_1\widehat{CC}ə-\in$
w $CV_1\widehat{CC}ə-\in$ w		w $CV_1\widehat{CC}ə-C\in$ w	
y $Cɪ\widehat{CC}ə-\in$ w	y $Cɪ\widehat{CC}ə-\in$ w	y $Cɪ\widehat{CC}ə-C\in$ w	y $Cɪ\widehat{CC}ə-\in$ y
y $C\alpha\widehat{CC}ə-\in$ w	y $C\in\widehat{CC}ə-\in$ y w	y $C\alpha\widehat{CC}ə-C\in$ w	y $C\in\widehat{CC}ə-\in$ y
ɔ $C\alpha\widehat{CC}ə-\in$ w	ɔ $C\alpha\widehat{CC}ə-\in$ w	ɔ $C\alpha\widehat{CC}ə-C\in$ w	ɔ $C\alpha\widehat{CC}ə-\in$ y
w $C\alpha\widehat{CC}ə-\in$ w	w $C\in\widehat{CC}ə-\in$ w	w $C\alpha\widehat{CC}ə-C\in$ w	w $C\in\widehat{CC}ə-\in$ y
w $C\in\widehat{CC}ə-\in$ w	w $Cɪ\widehat{CC}ə-\in$ w	w $C\in\widehat{CC}ə-C\in$ w	w $Cɪ\widehat{CC}ə-\in$ y
[cimʈao]	[cimʈio]	[cimʈano]	[cimʈie]
[bhæɲcao]	[bheɲcio]	[bhæɲcano]	[bheɲcie]
[palʈao]	[palʈio]	[palʈano]	[palʈie]
[pɔstao]	[postio]	[pɔstano]	[postie]
[ʈhokrao]	[ʈhukrio]	[ʈhokrano]	[ʈhukrio]

It will have been clear from the above discussion that an interrelation between the vowel of the stem syllable and that of the ending syllable can be shown in terms of vowel harmony. Vowel harmony statement is not made merely on the phonetic sequences of the two syllables. For some of the categories feature of junction and intervening C element of structure have also been taken into account.[1] Forms are grouped in two categories, close forms and open forms which have variable vowel differences in the stem syllable according to the nature of different endings. The statement of vowel harmony relation is also related to the statement of grammatical categories with reference to the ending of different structures.

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1. See for instance, forms of the scatter pa- with [-le] and [-be], ([pele], [pabe]). on page
Compare also, for example, imperative forms with [-o] (Present) and [-o] (future).

CHAPTER 11.

C Element of Structure

11.0 Stem Syllable initial C-.

11.0.1 CVC- Stem Structure.

11.0.2 CV- Stem Structure.

11.0.3 CVCə- and VCə- Stem Structures.

11.0.4 CVC͡Cə- and CVC/CVCə- Stem Structures.

11.1 Stem syllable final -C.

11.1.1 CVC- Stem Structure

CVC + V .
CVC + Ø .
CVC + C- .

11.1.2 VC- Stem Structure.

11.2 -C͡C- clusters in CVC͡Cə and VC͡Cə- stem structures.

11.3 -C/C- sequences in CVC/CVCə- stem structure.

11.4 Geminated Junction in stem structures.
CV-, (C)VCə-, (C)VC͡Cə- and CVC/CVCə- .

C ELEMENT OF STRUCTURE

11.0 Stem Syllable initial C-

Monosyllabic stems.

11.0.1 CVC- stem structure

So far as initial C- of CVC- stems is concerned, all the four systems, Plosive, Liquid, Sibilant and Nasal are stated as the C element of structure in stem syllable initial. Thus we have

PVC, LVC, SVC, and NVC.

Initial Plosive system.

P in PVC- stem structures is a four term phonematic system. Any of the four units, b, d, j or g is possible in syllables for which the initial prosodic system $v/\bar{v}$, $h/\bar{h}$ can be stated. Syllables where d is stated as the unit of structure require further to be distinguished in terms of the $r/\bar{r}$ prosodic system.

A plosive initial stem syllable may then be: -

1. Non-voiced and non-breathy $P_{\bar{v}\bar{h}}VC$- phonetic exponents of which are absence of voicing before the release and voiceless release without aspiration. (See km. of [pake] (No.13)

2. Non-voiced and breathy $P_{\bar{v}h}VC$- phonetic exponents of which are absence of voicing before the release and voiceless

release with aspiration. (See km. No.14 of [khaṭe])

3. Voiced and non-breathy $^{v\bar{h}}P_4VC$- phonetic exponents of which are voicing before the release and voiced release without aspiration. (See km. No.15 of [bujhe]).

4. Voiced and breathy $^{vh}P_4VC$- phonetic exponents of which are voicing before the release and voiced release with aspiration. (See km. No.16 of [bhoge]).

Initial non-plosive system.

The two phonematic units l and r constitute the L-sub-system. They are both C- elements of structure in $^{v\bar{h}}$ syllables.

S in SVC- stem structure is a single term system in $^{\overline{vh}}$ syllables.

Two phonematic units m and n constitute the N-sub system. They are both C- elements of structure in $^{v\bar{h}}$ syllables.

These are exemplified in tabular form below. The examples chosen cover the full range of possibilities of verbal forms in so far as the initial C- element of structure is concerned. The non-finite verbal forms in [-a] have been given together with the translation equivalent of the English infinitive form.

Table of initial C- of CVC- stems

		$\overline{vh}$CVC-	$\bar{v}h$CVC-	$v\bar{h}$CVC-	vhCVC-
PLOSIVE SYSTEM	b	[paka]	[phaʈa]	[baja]	[bhaba]
		'to ripen'	'to split'	'to nag'	'to think'
	$\bar{r}$ d	[tola]	[thaka]	[dækha]	[dhɔra]
		'to lift'	'to stay'	'to see'	'to catch'
	$\bar{r}$ ɖ	[ʈana]	[ʈhæka]	[ɖaka]	[ɖhaka]
		'to pull'	'to run aground'	'to call'	'to cover'
	j	[capa]	[chapa]	[jɔpa]	[jhola]
		'to press'	'to print'	'to mutter'	'to hang'
	g	[kaʈa]	[khaʈa]	[gona]	[ghɔʈa]
		'to cut'	'to work'	'to count'	'to happen'
NON-PLOSIVE SYSTEM	l	-	-	[lekha] 'to write'	-
	r	-	-	[rakha] 'to keep'	-
	s	[ʃekha] 'to learn'	-	-	-
	m	-	-	[maja] 'to rub'	-
	n	-	-	[naca] 'to dance'	

It will be seen from the table above that two term system of $v/\bar{v}$ is relevant for L-, S-, N- subsystems but $h/\bar{h}$ is not relevant.

11.0.2 CV- Stem structure

A very limited number of forms is found with stem structure CV-. These do not show very different pattern∫ from forms of the CVC- stem structure, so far as the initial C- is concerned. One exception is that where the phonematic unit is d^{r}, no prosodic structure is found.

Initial Consonants of CV- stems

		$\overline{vh}$ CV-	$\bar{v}h$ CV-	$v\bar{h}$ CV-	vh CV-
PLOSIVE SYSTEM	b	[pawa] 'to get'	-	[bɔwa] 'to carry'	-
	d^{r}	-	[thowa] 'to keep'	[dæwa] 'to give'	[dhowa] 'to wash'
	j	[cowa] 'to ooze'	[chowa][1] 'to touch'	[jawa] 'to go'	-
	g	[kɔwa] 'to tell'	[khawa] 'to eat'	[gawa] 'to sing'	-
NON-PLOSIVE SYSTEM	l	-	-	[lɔwa] 'to take'	-
	r	-	-	[rowa] 'to plant'	-
	s	[∫owa] 'to lie down'	-	-	-
	n	-	-	[nawa] 'to bathe]	-

1. Alternative pronunciation [chõwa].

11.0.3 Extended stem structures : CVCə- and CVə

Dissyllabic stem structures CVCə- and CVə- are regarded as extensions from the monosyllabic stem structures CVC- and CV- respectively.[1] Thus, for the non-finite forms:

Non-extended: CVC- [kaʈa] 'to cut' (Non-Causative)

Extended : CVCə- [kaʈano] 'to cause to cut' (Causative)

Non-extended: CV- [nawa] 'to have a bath' (Non-Causative)

Extended : CVə- [nawano] 'to cause to have a bath' (Causative)

There are a few verbs which have stems similar to extended stem structures with no non-extended structures in their formal scatter. e.g.

CVCə- : [laʈhano] 'to beat'

CVə- : [miyano] 'to vanish (crisp)'

At the phonological level these structures, though they do not have any non-extended structures will be treated as extended structures.

Since the vast majority of the forms in these dissyllabic structures are extended, initial C- system is exactly identical

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1. Forms from extended stem structure are regarded as causative forms and those from non-extended structure are non-causative. For causative and non-causative forms see § 1.20.

to the one mentioned for non-extended monosyllabic stem structures CVC- and CV- .

11.0.4 Non-extended stem structures: CV͡CCə-, CVC/CVCə-

Forms in non-extended dissyllabic stem structures, CV͡CCə- are non-reduplicated, and in non-extended trisyllabic stem-structures are reduplicated. Thus, for the non-finite forms:

Dissyllabic : CV͡CCə- [cimʈano] 'to pinch'

Trisyllabic : CVC/CVCə- [ghɔrghɔrano] 'to make rattling sound'.

So far as the initial C- system is concerned, the sub-systems P V͡CCə-, L V͡CCə-, S V͡CCə-, N V͡CCə- : PVC/CVCə LVC/CVCə-, SVC/CVCə-, NVC/CVCə- of the dissyllabic and trisyllabic stem structures C V͡CCə- and CVC/CVCə-, are exactly identical with the sub-systems of the initial C- in (C)VC- stem structures.

A few examples are given below for illustration.

CVCCə-		$\overline{vh}$C-	$\bar{v}$hC-	v$\bar{h}$C-	vhC-
PLOSIVE SYSTEM	b	[pichlano] 'to slip'	[phɔʃkano] 'to slip'	[bɔdlano] 'to change'	[bhɔɽkano] 'to be puzzled'
	d^{rl}	[tɔɽpano] 'to jump over'	[thetlano] 'to bruise'	[dabɽano] 'to chase'	[dhɔmkano] 'to threaten'
	d^{r}	[ʈɔpkano] 'to scale'	[ʈhokrano] 'to tap'	[ɖɔmʃano] 'to bite'	—
	j	[cimʈano] 'to pinch'	[chiʈkano] 'to scatter'	[jɔnmano] 'to take birth'	[jhɔlʃano] 'to dazzle'
	g	[kamɽano] 'to bite'	[khamcano] 'to pinch'	[gɔrjano] 'to roar'	[ghoŋɽano] 'to groan'
NON - PLOSIVE SYSTEM	l			[lɔʈkano] 'to hang'	
	r			[rɔgɽano] 'to rub'	
	s	[ʃɔmjhano] 'to explain'			
	m			[mocɽano] 'to twist'	
	n			[nɔrmano] 'to soften'	

CVC/CVCə		$\overline{vh}$ C-	$\bar{v}h_C$-	$v\bar{h}_C$-	vh_C-
PLOSIVE SYSTEM	b	[pɪtpɪtano] 'to wink'	[phɔrphɔrano] 'to show off'	[bɪrbɪrano] 'to mutter'	[bhɔ bhɔ ʃano] 'to gabble'
	$d^{\bar{r}}$	[tərbɔrano] 'to show off'	[thɔmthɔmano] 'to be moody'	[dɔmdɔmano] ' to make noise while moving'	[dhɔrphɔrano] 'to struggle in agony'
	$\underline{d}^{r}$	[ʈipʈipano] 'to drizzle'	[ʈhɔkʈhɔkano] 'to knock'	-	[ɖhɔkɖhɔkano] 'to sound'
	j	[culbulano] 'to look within and without'	[chɔlchɔlano] 'to look like weeping' 'to	[jɔljɔlano] 'to shine'	[jhɔmjhɔmano] 'to make jingling sound'
	g	[kɔtmɔtano] 'to look angrily'	[khɔmkhɔmano] 'to snob'	[gɔngɔnano] 'to mutter'	[ghenghenano] 'to repeat'
NON - PLOSIVE SYSTEM	l			[uʈputɖano] 'to tumble about'.	
	r			[rəŋcɔŋano] 'to paint'	
	s	[ʃɔnʃɔnano] 'to make noise (of the wind)			
	m			[miʈmiʈano] 'to wink'	
	n			[niʃpiʃano] 'to feel uneasy'	

11.1 Final -C systems of the stem syllable.

11.1.1 i. CVC- stem structure

The system of final -C is different from the system of initial C- in both phonematic and prosodic units. All the four sub-systems, P, L. S. N are stated for -C in final position as in initial position. There are certain phonetic and phonological differences in the system of the final -C from from the initial C-. Flapped [-ɽ] and velar nasal consonant [-ŋ] occur in final position. Flapped [-ɽ] is located under the retroflex plosive series, and [-ŋ] as a velar unit under N. No verbal forms with a final [-gh], [-ɖ], [-ɖh], or [-bh] have been found. Thus we have,

CVP_4 , CVL_2 , CVS_1 , CVN_3 .

There is a complicated prosodic interrelation between the stem final -C and the ending initial -C-. In the forms of some categories the stem final -C is ^{h} prosodic while in others $^{\bar{h}}$ prosodic, in some it is ^{v} prosodic while in certain others it is $^{\bar{v}}$ prosodic.

Examples:

-C-$^{\bar{v}h}$ [mɔthe] 'he kneads'.

-C-$^{\bar{\bar{v}}h}$ [motte] 'you used to knead'

-C-$^{v\bar{h}}$ [modbe] 'you/he will knead.'

This prosodic interrelation between the stem-final -C- and the ending initial -C- justifies the abstraction of

h/$\overline{h}$ and v/$\overline{v}$ as prosodies. This also shows that a different statement is required for the junction of the stem and ending. Hence the discussion about final -C will be made under separate sections:

(a) forms in -V ending, (b) -C- ending.

(a) Vowel initial ending.

Examples are given in [-a] ending with the translation equivalent to English infinitive form

		CVC-$\overline{vh}$ V	CVC-$\overline{vh}$ V	CVC-v$\overline{h}$ V	CVC-vh V
PLOSIVE SYSTEM	b	[jɔpa] 'to mutter'	[lopha] 'to pick'	[ɖoba] 'to sink'	-
	$\underline{d}^{\overline{r}}$	[pata] 'to spread'	[mɔtha] 'to knead'	[kãda] 'to cry'	[ʃadha] 'to offer'
	$\underline{d}^{r}$	[kaʈa] 'to cut'	- [1]	[pɔɽa] 'to read'	-
	j	[kaca] 'to wash'	[mocha] 'to wipe'	[maja] 'to rub'	[bojha] 'to realise'
	g	[paka] 'to ripen'	[dækha] 'to see'	[jaga] 'to wake up'	-
NON - PLOSIVE SYSTEM	l			[bɔla] 'to tell'	
	r			[kɔra] 'to do'	
	s	[bɔʃa] 'to sit'			
	m			[jɔma] 'to freeze'	
	n			[jana] 'to know'	
	ŋ			[bhaŋa] 'to break'	

1. Forms with [-ʈh] as the final -C element of structure is not found in CVC- stem structure. [-ʈh] is, however, found as final -C in VC- and CVCə (extended) stem structures. e.g. [uʈha] 'to get up', [paʈha] 'send' (Infra).

It will be seen from the above table that four term system of $v/\bar{v}$, $h/\bar{h}$ is relevant for -P and two term system of $v/\bar{v}$ is relevant for the -L, -J and -N sub-systems.

(b) Zero ending forms

-P in CVP structure in zero-ending forms is $h/\bar{h}$ and $v/\bar{v}$ prosodic. Thus we have $CVP_4^{v/\bar{v},h/\bar{h}}$, $CVL_2^{v\bar{h}}$ $CVS^{\bar{v}\bar{h}}$ $CVN_3^{v\bar{h}}$

		CVC-$^{\bar{v}\bar{h}}$ ∅	CVC-$^{\bar{v}h}$ ∅	CVC-$^{v\bar{h}}$ ∅	CVC-^{vh} ∅
PLOSIVE SYSTEM	b	[jɔp] 'mutter!'		[qob] 'sink!'	
		[lop] [1] 'pick!'	[loph]/[loΦ] [1] 'pick!'		
	d^r	[pat] 'spread'		[kãd] 'cry!'	
		[mɔt] [2] 'knead!'	[mɔth] [2] 'knead!'	[ʃad] [3] 'offer!'	[ʃadh] [3] 'offer!'
	d^r	[kaʈ] 'cut!'		[pɔɽ] 'read!'	
	j	[kac] 'wash!'		[maj] 'rub!'	
		[moc] [4] 'wipe!'	[moch] [4] 'wipe!'	[boj] [5] 'understand!'	[bojh] [5] 'understand'
	g	[pak] 'ripe' [6]		[jag] 'awake!'	
		[dæk] 'see!'	[dækh] [6] 'see!'		
NON-PLOSIVE SYSTEM	l			[bɔl] 'tell!'	
	r			[kɔr] 'do!'	
	s			[bɔʃ] 'sit!'	
	m			[jɔm] 'freeze'	
	n			[jan] 'know'	
	ɳ			[bhaɳ] 'break'	

1, 2, 3, 4, 5, 6. Alternative pronunciation.

It will be seen from the above examples that $h/\bar{h}$ prosodies are only relevant in alternative pronunciation.

(c) C Initial ending

Forms whose stem final element is a -C and ending initial is a -C, involve an interesting prosodic system in the stem-ending -CC- sequence. It has already been stated that the initial -C- of the ending structure is a two term sub-system, P and L, and that three phonematic units labial, apical and dorsal constitute the plosive sub-system and one unit L sonstitutes the liquid sub-system. -C-C- sequences of stem and ending form the following patterns:

-P-P- , -S-P- , -L-P- , -N-P- ; -P-L- , -S-L- , -L-L- , and -N-L-.

Where the ending initial -C- is [-b-] the whole -C-C- sequence is voiced and never aspirated with any -C- element of structure in the stem final position. (See km.26 of [jobbe].

Where the ending initial -C- is [-t-] and the stem final -C- is P or S the sequence as a whole is voiceless and where the stem final C is -L- or -N- the first part of the sequence is voiced and the later part is voiceless and in all cases the sequence is characterized by non-breathy release in articulation. (See km.28 of [dekte]).

Where the ending initial -C- is [-ch-] and the stem final -C- is P or S the sequence as a whole is voiceless and where the stem final C is -L- or -N- the first part of the sequence is voiced and the later part is voiceless and in all cases the sequence is characterized by breathy release in articulation.

(See km. 57 of [kacche].

Where the ending initial C is [-l-] the -C-C- sequence gives two patterns: with voiceless P or S in the stem final position the sequence is voiceless voiced and with voiced plosive, liquid or nasal in the stem final position the sequence as a whole is voiced. (See km. 60 pf [pakle]).

Where both the C- elements in -C-C- sequence are either any of the plosive units b in $\overline{vh}$ prosodies, d in $\overline{vh}$ prosodies, j in $\overline{vh}$ prosodies or Liquid unit l in $\overline{vh}$ prosodies, or the first C is nasal unit m and the second C is plosive unit b or the first C is a nasal unit n and the second C is plosive unit d , the sequence as a whole is homorganic in articulation. Thus, homorganic stem-ending sequences are:

-P-P- -b-b- [jobbe], -d-d- [patte] , -j-j- [kacche]

-L-L- -l-l- [mille]

-N-P- -m-b- [jombe] , and -n-t- [mante].

It is to be noted that except in a very few verbs cited below, the same consonant is not repeated in a stem syllable of a verbal form.[1]

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1. In nominal and adjectival forms the same consonant is repeated in intervocalic and final positions. e.g. [kaka] 'uncle' [kaku] 'scream', [kak] 'crow', [caca] 'uncle' [cãc] 'lac' [mama] 'uncle' [nana] 'grandfather', [dada] 'grand father' [baba] 'father' [caci], [kaki], [mami], [phupho] 'aunt', [nani], [dadi], 'grandmother' [ʈaʈu] 'pony', [tũte] 'sulphate of copper' [juju] 'bugbear' [pepe] 'papaya fruit' [pap] 'sin' [boba] 'dumb' [lal] 'read', [gæg] 'hœarseness' [cõc] 'hump' [nun] 'salt' [nona] 'salty' [mom] 'wax', [mem] 'English lady', [noni] 'cream' [thuthu] 'sputum' [phupha] 'uncle' [phuphi] 'aunt', [dhũdhũ] 'blazing as fire' [dhãdhã] 'puzzle'.

[kõkano] 'to groan', [cãca] 'to scrape',

[cãcano] 'to speak aloud',

[ṭaṭa] 'to be heard',

[ṭaṭano] 'to be inflamed',

[ṭuṭa] 'to break',

[ʃoʃa] 'to suck, to soak',

[ʃaʃano] 'to threaten',

[læ̃lano] 'to instigate',

[lula] 'to be softened'.

In a stem syllable, an aspirated consonant occurs only in one place, initially or finally, that is to say, if the stem initial consonant is aspirated the stem-final consonant is unaspirated and vice versa.

Non-repetition of same consonant and non-repetition of aspiration in the same syllable distinguish Bengali verbal forms from the forms in other word classes.

The following examples will illustrate this.

(Forms whose two C elements of the junction express one prosodic characteristic, eg. V or $\bar{V}$, will be listed under 'uniform' and those expressing more than one prosodic characteristics, eg. $\bar{V}$ V or V$\bar{V}$, will be listed under 'non-uniform')

		UNIFORM*			NON-UNIFORM	
		v̄h CVC - CV	v̄h CVC - CV	v̄h CVC - CV	vv̄h CVC - CV	vv̄h CVC - CV
PLOSIVE + PLOSIVE	b+	[jobbe] 'he will mutter'	[jopte] 'you used to mutter'	[jopche] 'he is muttering'		
		[lubbe] 'he will pick'	[lupte] You used to pick	[lupche] 'he is picking'		
		[ɖubbe] 'he will sink'	[ɖupte] 'you used to sink'	[ɖupche] 'he is sinking'		
	r̄ d+	[padbe] 'he will spread'	[patte] 'you used to spread'	[patche] 'he is spreading'		
		[modbe] 'he will knead'	[motte] 'you used to knead'	[motche] 'he is kneading'		
		[kãdbe] 'he will cry'	[kãtte] 'you used to cry'	[kãtche] 'he is crying'		
		[ʃadbe] 'he will offer'	[ʃatte] 'you used to offer'	[ʃatche] 'he is offering'		
	r d+	[kaɖbe] 'he will cut'	[kaʈte] 'you used to cut'	[kaʈche] 'he is cutting'		
		[poɽbe] 'he will read'			[poɽte] 'you were reading'	[poɽche] 'he is reading'
	j+	[kajbe] 'he will wash'	[kacte] 'you used to wash'	[kacche] 'he is washing'		
		[mujbe] 'he will wipe'	[mucte] 'you used to wipe'	[mucche] 'he is wiping'		
		[majbe] 'he will rub'	[macte] 'you used to rub'	[macche] 'he is rubbing'		
		[bujbe] 'he will under-stand'	[bucte] 'you used to under stand '	[bucche] 'he is under-standing'		

	g+	[pagbe] 'It will ripen'	[pakte] 'you used to ripen'	[pakche] 'it is ripening'		
		[degbe] 'he/you will see'	[dekte] 'you used to see'	dekche] 'he is looking'		
		[jagbe] 'he will wake'	[jakte] 'you used to wake'	[jakche] 'he is waking'		
NON - PLOSIVE + PLOSIVE	s+	[bo be] 'he/you will sit'	[boʃte] 'you used to sit'	[boʃche] 'he is sitting'		
	l+	[bolbe] 'he/you will say'			[bolte] 'you used to say'	[bolche] 'he is telling'
	r+	[korbe] 'he/you will do'			[korte] 'you used to do'	[korche] 'he is doing'
	m+	[jombe] 'he/you will freeze'			[jomte] 'you used to freeze'	[jomche] 'he is freezing'
	n+	[janbe] 'he/you will know'			[jante] 'you used to know'	[janche] 'he is knowing'
	ŋ+	[bhaŋbe] 'he/you will break'			[bhaŋte] 'you used to break'	[bhaŋche] 'he is breaking'

		Uniform	non-uniform
		v CVC-CV	vv CVC - CV
PLOSIVE + LIQUID	b+	[ɖuble] 'you sank'	[jople] 'you muttered'
	r d +	[kãdle] 'you cried'	[luple] 'you picked' [patle] 'you spread'
		[ʃadle] 'you offered'	[motle] 'you kneaded'
	r d +	[poɽle] 'you read'	[kaʈle] 'you cut'
	j +	[bajle] 'you rang'	[kacle] 'you washed'
		[bujle] 'you understood'	[mucle] 'you rubbed'
	g +	[jagle] 'you woke up'	[pakle] 'you ripe'
			[dekle] 'you saw'
NON-PLOSIVE + LIQUID	s +		[boʃle] 'you sat'
	l +	[bolle] 'you told'	
	r +	[korle] 'you did'	
	m +	[jomle] 'you were frozen'	
	n +	[janle] 'you knew'	
	ŋ +	[bhaŋle] 'you broke'	

11.1.2 VC- Stem structure

A very limited number of verbs are found in this structure. These do not show very different pattern from the CVC- stem structure, so far as the final -C is concerned. Just as the final -C of CVC- stem structure so also -C of VC- stem structure is a four term system. -P- , -L-, -S-, -N-. The linking feature of the stem and ending show exactly similar characteristics as that of the CVC- stem structure. The system appropriate to this structure are limited in various ways. So far as the -P element is concerned, labial unit b is absent, of the three units d , ɟ , g , d is always r prosodic and never $\overline{r}$ prosodic. ^{vh} prosodic structure is not found. That is to say, no forms with final [-p], [-ph], [-b], [-bh], [-t], [-th], [-d], [-dh] or [-gh], [-jh], [ɖh], [-ɖ] occur. One phonematic unit n constitutes N in VN- structure. That is no forms with final [-m] or [-ŋ] are found.

Forms of this stem structure are found with final [-k], [-g], [-c], [-ch], [-ʈ], [-ʈh], [-ɽ], [-ʃ], [-l], [-r], and [-n].

Examples: [ãka], 'to draw', [haga] 'to have motion!
[hãca] 'to sneeze!, [ocha] 'to distil',
[haʈa] 'to walk!', [oʈha] 'to get up',
[oɽa] 'to fly', [aʃa] 'to come',
[hara] 'to loose!, [hæla] 'to nod!,
[ana] 'to bring'.

11.2 -C͡C- clusters

CVC͡Ce- and VC͡Ce- stem structures.

The sub-systems of the dissyllabic structure (C)VC͡Ce- provide an interesting study as regards the combination of the inter-vocalic consonant clusters.

Where both the C elements are either plosive unit g in $\overline{vh}$ prosodies or plosive unit j in $\overline{vh}$ prosodies or liquid unit in l in $\overline{vh}$ prosodies, the cluster as a whole is geminated. Where first C element is nasal unit n unit and the second C is plosive unit d in ^{r} prosody, the cluster as a whole is in $\overline{vhr}$ prosodies and is homorganic in articulation.

Thus, geminated and homorganic -C͡C- clusters are

-P͡P-	gg$^{\overline{vh}}$	[dhakkano] 'to knock', jj$^{\overline{vh}}$ [ajjano] 'to plant',
-L͡L-	-ll-$^{\overline{vh}}$	[cillano] 'to cry',
-N͡P-	-nd-$^{\overline{vhr}}$	[khɔɳɖano] 'to cancel',

Everywhere else the cluster is heterorganic. Heterorganic consonant clusters within the stem in dissyllabic stem structure (C)VC͡Ce- form the following patterns.

-P͡P- -P͡L- -P͡S- -P͡N- ;

-L͡P- -L͡S- -L͡N- ;

-S͡P- -S͡L- ;

-N͡P- -N͡L- -N͡S- -N͡N- ;

There is no -SN- patterns of combination in this type of clusters.

One characteristic feature of these clusters in this structure is that none is characterized by breathy release except the following three forms: [achɽano], [pachɽano] and [ɔmjhano].[1]

In -N͡C- clusters nasality affects the preceding vocalic articulation.

Where N is a labial unit m in -N͡P- clusters, C- is any of the three units d , j , g other than labial unit b.

In -N͡N- cluster the initial -N- is n unit and the final -N- is m unit.

Almost any unaspirated Plosive, or any Liquid, or the Sibilant may form one of the two components, of -CC- clusters, but their combination possibilities are restricted.

The prosodic characteristic of the clusters is either uniform, i.e. a cluster as a whole is voiced or voiceless, or non-uniform, i.e. a cluster is characterized by voicelessness and voicing, or by voicing and voicelessness.

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1. They are not shown in the following table.

Dissyllabic Stem Structure (C)VC͡Cə-

		Uniform		non-uniform	
		V̄ -C͡C-	V -C͡C-	V̄V -C͡C-	V̄V̄ -C͡C-
PLOSIVE + PLOSIVE	r -bd-	[jhapʈano] 'to clasp'	[ghabɽano] 'to bewilder'	[cɑpɽano] 'to pat'.	
	-bj-	[kɔpcano] 'to recite' like a parrot			
	-bg-	[ʈɔpkano] 'to scale'			
	r̄ -dg-	[ãtkano] 'to start with sudden fright'			
	r -dg-	[aʈkano] 'to stop'			[bhɔɽkano] 'to bewilder'
	r -jd-	[kɔcʈano] 'to knead'		[mocɽano] 'to twist'	
	-jg-	[mɔckano] 'to be wrenched'			
	r -dd-		[khedɽano] 'to drive away'	[hatɽano] 'to feel one's way'	
	r -gd-		[bigɽano] 'to vitiate'	[ãkɽano] 'to catch an object'	
	r -db-				[tɔɽpano] 'to jump'

		Uniform		non-uniform	
		-C̄C̄-	-C͡C-	-C̄C̄-	-C͡C-
PLOSIVE + NON - PLOSIVE	-bl-		[choblano] 'to bite'		
	-br-		[bhæbrano]	'to be frightened'	
	-dl-		[bɔdlano] 'to change'	[ʃãtlano] 'to soak in oil'.	
	-dr-		[ʃodrano] 'to reform'		
	-jl-		[khujlano] 'to itch'	[kɔclano] 'to rub'	
	-jr-		[gɔjrano] 'to groan'		
	-gl-		[uglano] 'to vomit'	[paklano] 'to wash'.	
	-dr-			[ʃãtrano] 'to swim'	
	-gr-			[ʈhokrano] 'to peck'	
	-ds-	[cupʃano] 'to cause to moisture'			
	-gs-	[cɔkʃano] 'to dazzle'.			
	-gn-		[lɔgnano] 'to fix date for marriage'.		

		Uniform		non-uniform	
		-C͡C̄-	-C͡C-	-C͡C̄.V-	-C͡C̄V-
NON - PLOSIVE + PLOSIVE	-rj-		[gɔrjano] 'to roar'		
	-lg-		[algano] 'to lift'		[culkano] 'to itch'
	-rd-				[bɔrtano] 'to happen'
	-ld-				[ulʈano] 'to turn upside down'
	-sg-	[phoʃkano] 'to slip'			
	-sd-	[ghɔsʈano] 'to rub'.	[musʈano] 'to be depressed'		
	-sd-	[pɔstano] 'to regret'.			
	-mg-				[cɔmkano] 'to startle'
	-mj-		[ʃɔmjano][1] 'to explain'.		[khamcano] 'to seize between thumb and finger'
	-mrd-		[kamrano] 'to bite'		[cimʈano] 'to punch'
	-ng-			'to simmer	[phɔnkano] with anger'
	-ŋc-				[bhaŋcano] 'to make faces'
	-ŋrd-		[niŋrano] 'to wring out'		

1. Alternative Pronunciation [ʃɔmʃhano]. See Foot note on p. 423.

		Uniform		non-uniform	
		-C͡C̄V-	-C͡CV-	-C͡C̄V̄V-	-C͡CV̄V̄-
NON-PLOSIVE + NON-PLOSIVE	-ls-				[jhɔlʃano] 'to dazzle'
	-rs-				[ɔrʃano] 'to devolve on'
	-rm-		[ʃɔrmano] 'to feel shy'		
	-sl-			[phuʃlano] 'to induce'	
	-ml-		[ʃamlano] 'to manage'		
	-mr-		[cumrano] 'to trim' (as a moustache)		
	-ŋl-		[hɑ̃ŋlano] 'to stir' (water)		
	-ms-				[cimʃano] 'to become tough'
	-ns-				[khunʃano] 'to soh in anger'
	-ŋs-		[ɖɔŋʃano] 'to bite'		
	-nm-		[jɔnmano] 'to take birth'		

11.3 The trisyllabic (reduplicated) stem structure CVC/CVCə-

The -C/C- sequences of reduplicated stem pattern CVC/CVCə- may be classified as follows:

-P/P- , -P/L- , -P/N-

-L/P- , -L/S- , -L/N-

-S/P- , -S/N-

-N/P- , -N/S- , -N/N-

There are no -P/S-, -S/L- and -N/L- sequences in this pattern.

The combination possibilities are open, except that the velar nasal [ŋ] and flapped [ɽ] do not occur as the second componant of a -C/C- sequence. In reduplicated form same consonant is never repeated in a stem syllable.[1] And the articulation concerned is always non-homorganic. The second componant of the -C/C- sequence is a stem initial -C- and has all the characteristic features of a stem initial C-.

The three phonematic units, m n and ŋ, constitute -N- and -C- is a term in the plosive and sibilant systems, in -N/C- sequence. Where the post nasal element is voiced the articulation is voiced throughout, and where it is voiceless, the sequence is characterized by voicelessness and voice. In -C/N- sequence P, L and S constitute the first element and m and n constitute the second. Where the pre-nasal element is voiced, voicing is maintained throughout the whole period of closure. Nasality affects the following vowel articulation. Where the pre-nasal C element is voiceless, the first part of the closure is voiceless, Like the -N̥N- cluster in the

1. Supra.

dissyllabic stem structure (C)VC̆Cə- the unit n constitutes the first element and m the second in -N/N- sequence in reduplicated forms. The whole sequence is voiced and the release is non-breathy.

The sequence -P/P-, -L/P-, -S/P- or -N/P- may be characterized by h/$\bar{h}$ prosody in addition to v/$\bar{v}$ prosody. Sequences of other structures are all characterized by non-breathy release. This will be clear from the following examples.[1]

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1. The reduplicated forms are repetition of the same action, or echoing sound. Translations for isolated forms are not always possible.

		UNIFORM				NON - UNIFORM			
		-C/C- vh	-C/C- vh	-C/C- vh	-C/C- vh	-C/C- vvh	-C/C- vvh	-C/C- vvh	-C/C- vvh
PLOSIVE + PLOSIVE	-dh-	[pɔtpɔtano] 'to crackle'							
	-db-	[piʈpiʈano] 'to blink'					[phɔɾphɔɾano]		
	-dg-	[kɔʈkɔʈano]					[khɔɾkhɔɾano] 'to make a scratching noise		
PLOSIVE + NON-PLOSIVE	-gl-							[liklikano]	
	-dm-							[miʈmiʈano]	

		UNIFORM				NON-UNIFORM			
		v̄v̄h -C/C-	v̄vh -C/C-	vv̄h -C/C-	vvh -C/C-	vv̄h -C/C-	vvh -C/C-	v̄v̄h -C/C-	v̄vh -C/C-
NON-PLOSIVE + PLOSIVE	-lg-					[kəlkəlano] 'to make noise'	[khəlkhəlano] 'to make noise'		
	-rg-				[ghɔɽghɔɽano] 'to make rattling noise'				
	-lj-					[culculano]	[chəlchəlano]		
	-lb-			[culculano]					
	-rd-					[tɔrtɔrano]			
	-rj-				[jhirjhirano]				
	-sg-								[ghɔʃghɔʃano]
	-ng-			[gungunano] 'to make low humming sound'	[ghenghenano]				
	-nj-				[jhɔ̃njhɔnano] 'to make zingling sound'				
	-nɖ-					[ʈunʈunano]			
	-nb-					[penpenano]			
	-mj-								
	-rʃ-					[ʃirʃirano]			

		UNIFORM				NON - UNIFORM			
		$\overline{-C/C-}^{vh}$	$\overline{-C/C-}^{vh}$	$\overline{-C/C-}^{vh}$	$\overline{-C/C-}^{vh}$	$\overline{-C/C-}^{vvh}$	$\overline{-C/C-}^{vvh}$	$\overline{-C/C-}^{vvh}$	$\overline{-C/C-}^{vvh}$
NON-PLOSIVE + NON-PLOSIVE	-lm-			[jhilmilano] 'to glitter'					
	-rm-			[mərmərano] ˈ					
	-sm-							[məʃməʃano]	
	-ns-					[ʃənʃənano]			
	-nm-			[minminano] 'to wink'					

One important point is to be noted about clusters and sequences where -N- is stated as an element of structure. -NC structure is stated for all three types: -C͡C- clusters in dissyllabic stem structure (C)VC͡Cə-, -C-C- sequences in stem and ending junction in monosyllabic stem structures (C)VC-

and stem sequences in trisyllabic reduplicated stem structure CVC/CVCə-

-N͡N- and -C͡N- patterns are stated only in -C͡C- clusters of dissyllabic stem structure (C)VC͡Cə- and in -C/C- sequence in reduplicated stem structure CVC/CVCə-

These can be grouped thus:

1. -C͡C- clusters in (C)VC͡Cə- : -N͡C- , -N͡N- , -C͡N-
2. -C/C- sequences in CVC/CVCə- : -N/C-, -N/N- . -C/N-
3. -C-C- stem and ending sequences in (C)VC- : -N-C-.

-C- in -N͡C- clusters can be P, L, S in reduplicated stems -C- in -N/C- sequences is P and S;and in stem-ending sequences -C- in -N-C- is P and L.

-N- in -N͡C- clusters, -N/C- reduplicated stem sequences, and -N-C- stem ending sequences, can be any of the three nasal units m , n and ŋ.

-NN- in both -N͡N- clusters and -N/N- reduplicated stem sequences is a combination of the two nasal units n and m respectively.

-C- in -C͡N- clusters is P and L, and in -C/N- reduplicated stem sequences -C- is P, L and S.

Any of the two nasal units m and n constitutes -N- in -C͡N- clusters, and the labial unit m constitutes -N- in -C/N-

reduplicated stem sequence.

11.4 Geminated junction in Stem Structures CV-, (C)VCə-, (C)VC͡Cə- and CVC/CVCə

Where the stem ends in -V or -ə and the ending begins with [-ch-] the stem-ending linking feature is characterized by gemination, that is, there is in the junction closure of long duration, coupled with voicelessness and breathy release. This feature of gemination is abstracted as a prosody of junction and is denoted by a raised ^{g} in the formulae.[1] Thus, the generalized formula of form [khacche] is CV ^{g} CV and not CVC-CV. The system appropriate to the junction of this structure is limited, and is therefore, different from the systems appropriate to the -C-C- (stem + ending) sequence of monosyllabic stem structure (C)VC-, -C͡C- cluster of dissyllabic stem structure (C)VC͡Cə- or -ə/C- sequence of trisyllabic (reduplicated) stem structure, CVC/CVCə-. Final -C- in (C)VC- stem structure is an open system,[2] [-ch-] never occurs in -C͡C- clusters of (C)VC͡Cə- stem structure,[3] and two homorganic consonants do not occur in -C/C- sequence of a reduplicated form.[4] This feature of gemination is consistently observed in the junction of the forms in certain scatters of CV- stem structure and in all the polysyllabic stem structures: (C)VCə- , CVə- , (C)VC͡Cə- , and CVC/CVCə- where the ending is [-ch-].

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1. See 7.3.2
2. See 6.2.2.3
3. See 6.2.2.1
4. See 6.2.2.2

Examples:

CV -- ^{g}CV	[khacche]
CVCə- ^{g}CV	[kaʈacche]
əVCə- ^{g}CV	[uʈhacche]
CVə- ^{g}CV	[khawacche]
CV$\widehat{C}$Cə- ^{g}CV	[kamʈacche]
V$\widehat{C}$Cə- ^{g}CV	[ulʈacche]
CVC/CVCə- ^{g}CV	[piʈpiʈacche]

Conclusion.

My aim has been to attempt to state and discuss the phonology of the verbal piece in Colloquial Bengali recognizing the interrelation of stems and endings separately. The Phonological structures have been given in terms of C and V and prosodic elements, and systems have been established for particular place in structure both with regard to the stems and the endings. For some verbs the phonematic structure of the stem has been considered as constant throughout the scatter of the forms of those verbs, and phonetic differences observed in the stems have been treated as exponents of prosodic elements of the stems. For the stems of other verbs however, two phonematic structures have been given differing from one another in the V element, although certain phonetic differences in the scatter of the forms have been for these verbs too treated as exponents of prosodic elements. This treatment suggests a subclassification of verbs in Bengali (which is not always evident from the orthography) into two classes (i) those with one phonematic stem and (ii) those with two. These differences have been presented in the thesis but the implications of such an interpretation have not been explicitly stated.

By taking account of the verbal form as a whole an adequate statement can be made particularly with regard to the abstraction of stem and ending junction prosodies and of vowel harmony.

Throughout, phonetic and phonological features of the

verbal forms have been examined with reference to certain grammatical categories, such as finite and non-finite, causative and non-causative, and tense, grade and person. Any discussion of the phonology of other grammatical pieces, e.g. the nominal piece, would be relatable to a different set of grammatical categories, including, for example, number and gender, which have had no place in this analysis of the verbal piece. Even a cursory look at nominal pieces suggests that the phonology would be stated within a very different grammatical framework, and with different phonematic and prosodic systems from those given here. In fact those given here have relevance as a whole only for the verbal piece in Bengali and contribute to the meaning of 'verbal piece' in the analysis of that language.

APPENDICES

1. The Bengali Verbs ... ...

2. Text of Recordings ... ...

3. Bibliography ... ...

4. Palatograms & Kymographs ... ...

1. Bengali Verbal Forms[1]

ərsanə	[ɔrʃano]	To happen
auṭanə) aoṭanə)	[auṭano] [aoṭano]	to stir round (while boiling)
aoṛanə	[aoṛano]	to read, to recite.
akᵊṛanə	[ãkṛano]	to clasp with the arms, to catch to (an object) like a hook.
ãka	[ãka]	To mark, to draw.
aglanə	[aglano]	to watch, to keep from harm or loss.
aŋəlanə	[aŋlano]	to touch with fingers.
ãca	[ãca]	to guess.
ãcanə	[ãcano]	to wash the mouth after meal.
achi[2]	[achi]	I am.
ãcəṛanə	[ãcṛano]	to scratch, to tear.
achəṛanə	[ãchṛano]	to throw down violently, to beat against the ground.
ajəṛanə	[ajṛano]	to empty, to clear of content.
aʃʃanə	[ajjano]	to plant, to sow.
aṭəkanə	[aṭkano]	to confine, to prevent from escaping.
ãṭa	[ãṭa]	to stick
ãtəkanə) ãtkano)	[atkano]	to start with sudden fright.
ana	[ana]	to bring, to fetch.

1. Bengali verbal forms are given with non-finite ending [-a] or [-no] with the translation equivalent to English infinitive. Where infinitive forms are found with both [-a] and [-no], forms with only [-a] are given, and forms with [-no] are given where there are no forms with [-a]
2. Verbal forms from √ ach do not function as non-finite. See Defective verbs § 3.

apəsanə	[apʃano]	to throw down with violence, to beat anything repeatedly.
asa	[aʃa]	to come.
ãsanə	[ãʃano]	to disentangle, untwist or pick out. (as the strands of hemp or flax)
ukɽano	[ukɽano]	to pass away (as time), to get loose or be detached from the string while flying (said of a paper kite)
ukhəɽanə	[ukhɽano]	to soak in molasses a sugar.
okhəɽanə	[okhɽano]	to pull up by the roots.
ugəranə) ugəronə) ogəranə)	[ugrano] [ugrono] [ograno]	to vomit.
uglanə) uglonə)	[uglano] [uglono]	to be sick.
uganə) ugonə)	[ugano] [ugono]	to spring up, to arise
ughəranə	[ugrano]	to uncover, to undress.
ucəlanə) ũcəlanə) ocəlanə)	[uclano] [ũclano]	to move, to shake. to toss about.
ũcanə) õcanə)	[ũcano] [õcano]	to raise up, to lift.
ũcha) õcha) ucha) ocha)	[ũcha] [õcha] [ucha] [ocha]	to shake, to toss about in a parching vessel, or frying pan.
uchəɽanə) ochəɽanə)	[uchɽano] [ochɽano]	to vomit
uchəlanə	[achlano]	to overflow
uchanə	[uchano]	to throw off the thatching of a house
ujanə	[ujano]	to go against the stream
ujlanə	[ujlano]	to shake, to agitate.

uʈəkənə) uʈəkanə)	[uʈkono] [uʈkano]	to search.
uʈha) oʈha)	[uʈha] [oʈha]	to rise.
uɽa) oɽa)	[uɽa] [oɽa]	to fly.
ɯtəranə) otəranə) utərənə)	[utrano] [otrano] [utrono]	to come down, to cross over.
uthəlanə) utəlanə)	[utlano]	to swell up when boiled as a liquid, milk etc.
una	[una]	to melt, to dissolve.
upəcanə) upəcənə)	[upcano] [upcono]	to overflow.
upəɽanə) ubəɽanə)	[upɽano] [ubɽano]	to pull up by the roots.
upəra) ubəra)	[upɽa] [ubɽa]	to be plentiful, to be surplus.
ubəla	[ubla]	to boil.
uba	[uba]	to evaporate.
ubhərənə) ubhəranə)	[ubrono] [ubrano]	to unload (as boat).
ura	[ura]	to alight.
urʃ͡ənə	[urʃono]	to leak, to admit rainwater (said of a roof.
uʃ͡kanə	[uʃkano]	to stir (as fire), to advance (as the wick of an oil lamp).
ula) ola)	[ula] [ola]	to come down.
ulə̃ʈanə) ulʈanə)	[ulʈano]	to turn upside down.
uləsənə) ulsanə)	[ulʃono] [ulʃano]	to be elated with joy.
egonə	[egono]	to proceed.

eɽanə) eɽonə)	[æɽano] [eɽono]	to relinquish, to evade.
elanə	[ælano]	to unloose.
oʂanə	[oʃano]	to serve a mill or pedal with grain while it is working.
kə̃kanə) kõkanə)	[kõkano]	to groan.
kəcanə	[kɔcano]	to shoot forth.
kəcəʈanɔ	[kɔcʈano]	to knead.
kəcəlanə	[kɔclano]	to rub.
kəʈanə	[kɔʈano]	to fade.
kəpəcanə	[kɔpcano]	to begin to imitate (human voice) as a
kəra	[kɔra]	to do.
kəlanə	[kɔlano]	to sprout.
kələkəlanə	[kɔlkɔlano]	to ripple, to chirp.
kəltanə	[kɔltano]	to exude serum or thin matter (said of wound or sore of flesh).
kəʂa	[kɔʃa]	to work out (as a mathematical sum) to test gold etc., on the touchstone, to tighten.
kəoya	[kɔwa]	to speak.
kãɽa	[kãɽa]	to cleanse finely, (as rice).
kãda	[kãda]	to cry.
kaca	[kaca]	to wash,
kəchanə	[kɔchano]	to draw near.
kaʈa	[kaʈa]	to cut.
kaɽa	[kaɽa]	to snatch away.
katəranə) katranə)	[katrano]	to moan.
kaməɽanə	[kamɽano]	to bite.

kamanə	[kamano]	to shave.
kina)	[kina]	to buy.
kena)	[kæna]	
kilanə	[kilano]	to beat with the fist.
kũkəɽanə)	[kõkɽano]	to wrinkle, to shrink.
kõkəɽanə)		
kũcanə)	[kũcano]	to chip.
kũcanə)	[kucano]	
kuʈa)	[kuʈa]	to pound, to cut.
koʈa)	[koʈa]	
kuɽanə)	[kuɽano]	to pick up.
kuɽonə)	[kuɽono]	
kunanə	[kunano]	to feel or to give twinging pain.
koranə	[korano]	to scrape.
kulanə)	[kulano]	to suffice, to be adequate.
kulonə)	[kulono]	
kusanə	[kuʃano]	to rough-hew as timber.
kũckono)	[kõckano]	to shrink.
kõckano)		
kẽ̃ka	[kæ̃ka]	to draw or sweep from the floor etc. with the hand.
kelanə	[kelano]	to strip the bark or skin off.
kõcanə)	[kõcano]	to plait so as to form the front-luck of the loin-cloth.
kocanə)	[kõcano]	
kõɽa	[kõɽa]	to dig.
kõta)	[kõta]	to strain in order to void the bowels.
kotha)	[kotha]	
kotkanə	[kotkanə]	to thump.
kũda)	[kũda]	to turn in a lathe, to scrape.
kõda)	[kõda]	
kuda)	[kuda]	
koda)	[koda]	
kopanə)	[kopano]	to use or work with a digging instrument.
kobanə)	[kobano]	

koʂanə	[koʃano]	to shave (wood or metals) so as to make them taper off at each end like a shuttle.
khəɽəkhəɽanə	[khəɽkhɔɽano]	to make a scratching.
khəɳɖanə	[khɔɳɖanə]	to cancel.
khətanə	[khɔtanə]	to calculate.
khəra	[khɔra]	to be over-parched or over-fried.
khəsa	[khɔʃa]	to fall off.
khaoya	[khawa]	to eat.
khaʈa	[khaʈa]	to labour, to invest.
khapa	[khapa]	to unite, to become adjusted.
khabəlanə	[khablano]	to seize between the thumb and all the fingers repeatedly.
khaməcanə	[khamcano]	to seize between the thumb and all the fingers, to clutch with the nails.
khĩca) khẽca)	[khĩca] [khẽca]	to pull.
khicəɽanə	[khicɽano]	to be jumbled.
khiməcanə	[khiməcano]	to clutch with the nails.
khilanə	[khilano]	to turn an arch.
khũcəɽanə) khõcəɽanə)	[khucɽano] [khõcɽano]	to stir up (as a fire).
khõcanə)	[kocano]	to pierce.
khõja)	[khõja]	to seek for,
khuʈəranə	[khuʈrano	to scratch up.
khũʈa) khõʈa)	[khũʈa] [khõʈa]	to pick up (small articles) with the fingers or the beak.
khuʈanə	[khuʈano]	to make attempt to stand on legs (as a newly born calf does).

khõɽa	[khõɽa]	to dig.
khokanə	[khokano]	to hawk or cough for the purpose of expectoration.
khukəkhukanə	[khuklkukano]	to cough, to wheeze in the throat
khujəlanə	[khujlano]	to itch.
khoda	[khoda]	to dig.
khoyanə	[khowano]	to waste.
khola	[khola]	to open.
khuʂa	[khuʃa]	to cough slightly.
khusa	[khuʃa]	to thrust (a thing) among a number of other things.
kheŋranə	[khæŋrano]	to strike or thrash with a broom.
khecəkanə)	[khæckano]	to importune.
khẽkanə	[khækano]	to speak in an ill-natured manner.
khedɽanə	[khædɽano]	to drive away.
khedanə	[khædano	to drive away.
khepa	[khæpa]	to go mad.
khela	[khæla]	to play.
gəganə	[gɔgano]	to complain in a dissatisfied manner.
gəcha	[gɔcha]	to receive anything delivered in trust.
gəjanə	[gɔjano]	to shoot out.
gəjəjanə	[gɔjgɔjano]	to mutter dissatisfaction.
gəɽa	[gɔɽa]	to make.
gəɽəgəɽanə	[gɔɽgɔɽano	to rattle.
gəɳa	[gɔna]	to count.
gətanə	[gɔtano]	to give in trust.

gərjanə	[gərjano]	to roar.
gəla	[gəla]	to melt.
gə͡llanə	[gəllano]	to tie up in a sheaf or sheaves.
gəbəɽanə	[gəbɽano]	to do anything awkardly or clumsily.
gəsəgəsanə	[gəʃgəʃano]	to glow.
gaoýa	[gawa]	to sing.
gãja	[gãja]	to froth, to foam.
gãʈanə	[gãʈano]	to tie in knots.
gãta) gãtha)	[gãta] [gãtha]	to thread as beads, to string together.
gachanə	[gachano]	to grow.
gaɽa	[gaɽa]	to fix in the earth.
gada	[gada]	to ram, to cram.
gabanə	[gabano]	to make turbid by stirring (as the water of a pond), to tell tales.
gala	[gala]	to press out.
gila) gela)	[gila] [gela]	to swallow.
guchanə) gochanə)	[guchano] [gochano]	to arrange in order.
gũjəɽanə) gujəɽanə)	[gũjɽano] [gujɽano]	to thrust in, to pass.
gõja	[gõja]	to thrust in.
guɽanə) guɽonə) gũɽanə) gũɽonə)	[guɽano] [guɽono] [gũɽano] [gũɽono]	to pound.

gumranə	[gumrano]	to murmur.
gumanə	[gumano]	to be heated an emit a smell of mouldiness (as hay does when stacked before it is dry.)
gola	[gola]	to dissolve in a liquid.
gutanə) gutonə)	[gutano] [gutono]	to push.
gunəgunanə	[gungunano]	to buzz.
guʈanə	[guʈano]	to roll up.
gẽja	[gə̃ja]	to foam.
gẽʈhənə) gẽʈhanə)	[gẽʈhono] [gə̃ʈhano]	to tie a knot.
geŋanə	[gəŋano]	to groan.
gerənə) geranə)	[gerono] [gərano]	to tie a knot.
goŋranə	[goŋrano]	to utter inarticulate sounds like the dumb.
goŋanə	[goŋano]	" " " "
goɽanə	[goɽano]	to cut the root of.
gõyanə) goyanə)	[gõwano] [gowano]	to pass time.
ghəʈa	[ghəʈa]	to happen.
ghənanə	[ghɔnano]	to come up with.
ghəsa) ghəşa)	[ghəʃa] [ghɔʃa]	to grind, to rub. to grind, to rub.
ghã̠ʈa	[ghã̠ʈa]	to stir.
ghaʈa	[ghaʈa]	to decrease.
ghaɽanə	[ghaɽano]	to take upon one's shoulders.
ghabəɽanə	[ghabɽano]	to be pleased, to bewilder.
ghama	[ghama]	to perspire.
ghõʈa	[ghõʈa]	to stir up.

ghuca	[ghuca]	to withdraw, to remove.
ghunəghunanə	[ghunghunano]	to buzz.
ghumanə	[ghumano]	to sleep.
ghora	[ghora]	to move.
gholanə	[gholano]	to stir up.
ghuʂɽənə	[ghuʂɽono]	to creep in, to cancel (as a writing).
ghuʂəɽanə	[ghuʂɽano]	to force in, to press in.
ghuʂano	[ghuʃano]	to strike with fist.
ghoʂa	[ghoʃa]	to declare.
ghuʂanə	[ghuʃano]	to cause to retreat or fall back.
ghuʂkanə	[ghuʃkano]	to thrust aside.
ghẽʂa	[ghæ̃ʃa]	to rub, to approach.
gheŋanə	[ghæ̃gano]	to ask for anything urgently.
gheʈa	[ghæʈa]	to fall short.
ghera	[ghæra]	to enclose.
ghoŋran	[ghoŋrano]	to speak in a deep and hoarse sound.
cɔkəsanə	[cɔkʃano]	to dazzle.
cəməkanə	[cɔmkano]	to emit a sudden flash of light.
cəʈəkanə	[cɔʈkano]	to knead.
cəʈa	[cɔʈa]	to be irritated.
cəɽa	[cɔɽa]	to get upon.
cəra	[cɔra]	to graze.
cəla	[cɔla]	to go.
cəlkanə	[cɔlkano]	to move witha wave like motion (said of liquids carried in a vessel).
cəʂa	[cɔʃa]	to plough.
caoýa	[cawa]	to ask, to want.

cãca) cãcha)	[cãca] [cãcha]	to pare off the surface, to scrape.
caka) cakha)	[caka] [cakha]	to taste.
caga	[caga]	to rise.
caʈa	[caʈa]	to lick.
capəʈanə	[capɔʈano]	to smite or beat with the open hand, to slap, to tap.
capa	[capa]	to mount, to suppress.
capanə	[capano]	to lay upon, to load.
cabanə	[cabano]	to chew.
caranə	[carano]	to spread or cover evenly.
cipʈanə	[cipʈano]	to squeeze, to wring.
ciʈkanə	[ciʈkano]	to cause a throbbing sensation.
ciʈa	[ciʈa]	to crack, to split.
cina) cena)	[cina] [cena]	to know.
cipa	[cipa]	to press.
cimətanə	[cimʈano]	to pinch.
ciməranə	[cimərano]	to stick closely.
cira) cera)	[cira] [cera]	to tear.
cibanə	[cibano]	to chew.
cũca	[cũca]	to strip off with fingers.
cũya	[cũwa]	to burn away.
cuka	[cuka]	to be settled.
coʈanə	[coʈano]	to strike.
cuna	[cuna]	to choose.
cupəʂa) cupəsa)	[cupʃa]	to imbibe moisture.

cupanə	[cupano]	to cut thin.
cubanə	[cubano]	to immerse, to dip.
cablanə	[coblano]	to bite suddenly.
cumɽanə	[cumɽano]	to stroke the tail of (an animal to induce it to work).
cumanə	[cumano]	to kiss.
cuya	[cuwa]	to ooze out, to leak.
cura	[cura]	to grind, to pound.
culəkanə	[culkano]	to itch, to scratch.
coʂa	[coʃa]	to suck
ceta	[cæta]	to wake, to come to senses.
celanə	[cælano]	to chip (wood).
cuka	[cuka]	to err, to be adjusted
cokhanə	[cokhano]	to sharpen.
coʈanə	[coʈano]	to strike, to rebuke.
chəka	[choka]	to draw.
chəʈɖkanə	[chɔʈkano]	to shed out.
chaoya	[chawa]	to thatch.
chãka	[chãka]	to strain, to filtrate.
chãʈa	[chãʈa]	to clip, to crop.
chãda	[chãda]	to tie the hind legs of a cow at the time of milking.
chaʈa	[chaʈa]	to plaster a mud wall or plinth with new mud.
chaɽa	[chaɽa]	to quit, to abandon.
chana	[chana]	to knead.
chapa	[chapa]	to print.
chala	[chala]	to skin.

chĩcəɽanə) chẽcəɽanə)	[chĩcɽano] [chæ̃cɽano]	to drag.
chĩca) chẽca)	[chĩca] [chæ̃ca]	to empty of water, to bale out or in.
chĩɽa) chẽɽa) chiɽa) cheɽa)	[chĩɽa] [chẽɽa] [chiɽa] [cheɽa]	to tear.
chikəlanə	[chiklano]	to link together.
chiʈəkanə	[chiʈkano]	to be spattered.
chiʈa	[chiʈa]	to sprinkle.
chinanə	[chinano]	to snatch.
chipanə	[chipano]	to cover.
chila) chela)	[chila] [chæla]	to peel.
chõca	[chõca]	to wash the privities with water after voiding the bowels.
choya	[chowa]	to touch.
chuʈa) choʈa)	[chuʈa] [choʈa]	to run.
choɽa	[choɽa]	to throw.
chopanə) chobanə)	[chopano] [chobano]	to dye.
chola	[chola]	to peel.
chẽka) cheka)	[chæ̃ka] [chæka]	to sear, to roast in a frying pan.
chobəlanə	[choblano]	to bite suddenly.
jəɽanə	[jɔɽano]	to wrap round.
jənmanə	[jɔnmano]	to be born, to originate, to grow.
jəpa	[jɔpa]	to mutter prayers to one's self.
jəma	[jɔma]	to gather.

jɔra	[jɔra]	to become old.
jãka	[jãka]	to become showy or splendid.
jãta	[jãta]	to press.
jaga	[jaga]	to wake up from sleep.
jaca	[jaca]	to appraise.
jana	[jana]	to know.
japəʈanə	[japʈano]	to embrace.
jabɽanə	[jabɽano]	to sit close to anything, to embrace.
jaranə	[jarano]	to cause to decay.
jita) jeta)	[jita] [jeta]	to win, to conquer.
jiyanə	[jiano]	to restore to life, to keep or preserve alive.
jiranə	[jirano]	to rest to repose.
joʈa	[joʈa]	to come together.
juɽanə	[juɽano]	to grow cold.
joɽa	[joɽa]	to fasten, to unite closely.
jutanə	[jutano]	to beat with shoes or slippers.
jõka	[jõka]	to weigh.
jota	[jota]	to yoke, fasten.
jɔla	[jɔla]	to burn.
jhɔra	[jhɔra]	to exude, to leak, to fall.
jhɔlsa	[jhɔlʃa]	to be roasted.
jhãkranə	[jhãkrano]	to shake (any receptacle) violently in order to make its contents lie close.
jhãkanə	[jhãkano]	to lift up in order to examine its weight to shake.
jhaʈanə	[jhaʈano]	to sweep.

jhapanə	[jhapano]	to jump.
jhaɽa	[jhaɽa]	to thrash or beat out to rub off.
jhaməranə	[jhaməranɔ]	to distil.
jhalanə	[jhalano]	to mend or repair.
jhimanə	[jhimano]	to drowse.
jhũka	[jhũka]	to hitch forward, to bend down.
jhũja	[jhũja]	to trickle.
jhura) jhora)	[jhura] [jhora]	to trickle.
jhula) jhola)	[jhula] [jhola]	to hang.
jhẽʈanə	[jhẽʈano]	to sweep with a broom.
jhoɽa	[jhoɽa]	to cut off.
təkanə	[ʈɔkano]	to grow sour.
ʈənəʈənano	[ʈɔnʈɔnano]	to shoot, to throb.
ʈənəkanə	[ʈɔnkano]	to harden.
ʈəpanə	[ʈɔpano]	to drop.
ʈəpəkanə	[ʈɔpkano]	to leap over.
ʈəlʈəlanə	[ʈɔlʈɔlano]	to stagger.
ʈələməlanə	[ʈɔlməlano]	to be tossed about or up and down.
ʈəsəkanə	[ʈɔʃkano]	to be fregile.
ʈaoranə	[ʈaorano]	to shrivel, to stumble.
ʈãka	[ʈãka]	to stick together.
ʈaŋanə	[ʈaŋano]	to hang.
ʈaʈanə	[ʈaʈano]	to throb.
ʈana	[ʈana]	to draw.
ʈala	[ʈala]	to make pretexts or excuses.
ʈikəʈikanə	[ʈikəʈikano]	to tick, to chirp (as a house lizard

ʈĩka) ʈẽke) ʈika) ʈeka)	[ʈĩka] [ʈẽka] [ʈika] [ʈeka]	to last, to endure.
ʈipəʈipanə	[ʈipʈipano]	to drizzle.
ʈipa) ʈepa)	[ʈipa] [ʈepa]	to press, to pinch.
ʈuiyanə) tuyanə)	[ʈuyano]	to incite, to set on.
ʈõka	[tõka]	to winnow.
ʈoka	[toka]	to write down.
ʈuʈa	[ʈuʈa]	to break.
ʈapanə	[topano]	to drip.
ʈobanə	[ʈobano]	to send, to incite.
ʈhəka	[ʈhɔka]	to be deceived or cheated.
ʈhɔkəʈhəkanə	[ʈhɔkʈhɔkano]	to make sound like that of striking together two pieces of wood.
ʈhɔnəʈhənanə	[ʈhɔnʈhOnano]	to ring, to clank.
ʈhaorano	[ʈhaorano]	to consider, to determine.
ʈhara	[ʈhara]	to make a sign or signal to hint.
ʈhasa	[ʈhaʃa]	to knead, to compress.
ʈhikərənə	[ʈhikrano]	to spread, to rebound.
ʈhukəʈhukanə	[ʈhukʈhukano]	to tap, to knock.
ʈhoka	[ʈhoka]	to tap, to knock.
ʈhusa) ʈhuẽa)	[ʈhuʃa]	to cram.
ʈheka	[ʈkæka]	to touch, to come into contact.
ʈheŋanə	[ʈhæŋano]	to strike with bludgeon, to beat.
ʈhela	[ʈhæla]	to push.
ʈhesanə	[ʈhæʃano]	to lean, to recline against any object.

ʈhokərənə	[ʈhokrano]	to peck, to tap.
ɖəgənə) ɖogənə)	[dogano]	to cut off the tops or ends of a plant.
ɖərənə	[ɖɔrano]	to be in fear.
ɖəla	[ɖɔla]	to knead, to rub.
ɖãʈa	[ɖãʈa]	to threaten, to frighten.
ɖãɽənə	[ɖãɽano]	to stand, to wait.
ɖãʃənə	[ɖãʃano]	to be about to ripen.
ɖaka	[ɖaka]	to call.
ɖalənə	[ɖalano]	to cut off the branches.
ɖukərənə	[ɖukrano]	to sob.
ɖuba) ɖaba)	[ɖuba] [ɖoba]	to dive, to sink.
ɖelənə	[ɖælano]	to throw clods.
ɖhələkənə	[ɖhɔlkano]	to get loose, to decline as the setting sun.
ɖhəla	[ɖhɔla]	to fade and droop, to slope, to decline as the setting sun.
ɖhəsa	[ɖhɔʃa]	to crouch down, to break off in large pieces (as the bank of a river).
ɖhaka	[ɖhaka]	to cover.
ɖhala	[ɖhala]	to pour out.
ɖhipənə) ɖhipanə)	[ɖhipono] [ɖhipano]	to strike with the fist.
ɖhelənə	[ɖhelano]	to throw clods or stones at.
ɖhoka	[ɖhoka]	to enter.
ɖhula ɖhola	[ɖhula] [ɖhola]	to nod, to doze.
ɖhuʂənə	[ɖhuʃano]	to push or strike with the head, to butt.

ɖhekanə	[ɖhækano]	to shove to push.
ɖheʃanə) ɖhesanə)	[ɖhæʃano]	to insinnuate.
ɖhõɽa	[ɖhõɽa]	to seek, to search.
ɖhoya	[ɖhoa]	to carry.
təɽəpanə	[təɽpano]	to tie into a bundle or bundles. to leap over.
tərənə	[tɔrano]	to cause to pass over or cross.
tələnə	[tɔlano]	to go or sink to the bottom.
taoyanə	[tawano]	to cause to be heated.
takanə	[takano]	to open the eyes, to look.
taŋɽanə	[taŋɽano]	to keep for future use.
taɽanə	[taɽano]	to drive out.
tatanə	[tatano]	to heat, to warm.
tapanə	[tapano]	to heat, to warm.
tasanə	[taʃano]	to shuffle cards.
titanə	[titano]	to become moistened.
telanə	[telano]	to become oily or greasy, to make oily.
tiʂʈhanə	[tiʂʈhano]	to stay.
tɔɽa	[tɔɽa]	to break.
totanə	[totano]	to praise, to applaud.
tupəsanə	[tupʃano]	to shrivel, to be depressed.
turpanə	[turpano]	to bore a hole, to sew the long stitches.
tola	[tola]	to weigh, to raise.
tubəɽanə	[tubɽano]	to shrivel.
toʂa	[toʃa]	to satisfy.
teɽano	[tæɽano]	to become crooked, or curved.

topəɾanə) tobəɾanə)	[topɾano] [tobɾano]	to shrivel.
təulanə	[toulano]	to weigh.
thɔməkanə	[thɔmkano]	to be startled.
thərthərana	[thɔrthɔrano]	to tremble.
thaka	[thaka]	to be, to stay, to stop.
thapəɾanə) thabəɾanə)	[thapɾano] [thabɾano]	to slap. to pat.
thama	[thama]	to stop, to pause, to halt.
thaʃa	[thaʃa]	to knead.
thitanə	[thitano]	to settle down.
thoya	[thowa]	to keep, to put.
thuka) thoka)	[thuka] [thoka]	to spit.
thoɾa	[thoɾa]	to chop, to mince (as meat).
thubəɾanə	[thubɾano]	to blunt, to bruise.
thurəthuranə	[thurthurano]	to tremble.
thora	[thora]	to chop (as meat).
thetəlanə	[thetlano]	to bruise.
theka	[theka]	to be hindered.
thebəɾanə	[thebɾano]	to flatten.
thetanə) thotanə)	[thætano] [thotano]	to blunt, to dent.
thobəɾanə	[thobɾano]	to fall flat on the face.
daŋʃa	[dɔŋʃa]	to bite.
dəməkanə	[dɔmkano]	to sink, to fall off.
dəma	[dɔma]	to subside.
dərʃanə	[dɔrʃano]	to show.
dəla	[dɔla]	to rub, to knead.

dəbəkanə	[dəbkano]	to startle.
daoya	[dawa]	to cut, to reap.
dãɽanə	[dãɽano]	to stand.
daga	[daga]	to draw (lines).
dapanə	[dapano]	to stamp violently.
daba	[daba]	to press down.
dũyanə	[dõwano]	to tame.
dumərɽanə	[dumɽano]	to fold, to twist.
doya	[dowa]	to milk.
dola	[dola]	to hang loosely, to swing.
deoya	[dæwa]	to give.
dekha	[dækha]	to see.
dəuɽanə	[douɽano]	to run.
dhəkədhəkanə	[dhɔkdhɔkano]	to glitter.
dhəɽəphəɽanə	[dhɔɽphɔɽano]	to writhe.
dhəməkanə	[dhɔmkano]	to threaten.
dhəra	[dhɔra]	to catch.
dhəsa) dhbəsa)	[dhɔʃa]	to give way.
dhaoya	[dhawa]	to go fast.
dhatanə	[dhatano]	to threaten.
dhakkanə	[dhakkano]	to push.
dhaməsanə	[dhamʃano]	to throw into disorder.
dhara	[dhara]	to be indebted, to owe.
dhõka) dhoka)	[dhõka] [dhɔka]	to breath with difficulty, to palpitate (as with running or fear).
dhuna) dhona)	[dhuna] [dhona]	to clean (cotton) with a bow.

dhoya	[dhowa]	to wash.
dheɽanə	[dheɽano]	to have a looseness of the bowels.
dheyanə	[dhæano]	to think upon.
nəkəlanə	[nəklano]	to copy.
nəɽəkanə	[nəɽkano]	to drop and dangle repeatedly (as a baited hook in order to tempt a fish to gulp it).
nəɽa	[nəɽa]	to move.
naɽa	[naɽa]	to move.
naoya	[nawa]	to bathe.
naca	[naca]	to dance.
naba) nama)	[naba] [nama]	to get down, to alight.
naŋa	[naŋa]	to cross.
nalanə	[nalano]	to drivel.
naʃa	[naʃa]	to destroy.
niŋɽanə	[niŋɽano]	to wring out.
nikanə) nikonə)	[nikano] [nikono]	to smear or plaster with a solution of earth.
nikanəcukanə	[nikanocukano]	to plaster (a house) with a solution of earth and make it quite clean.
nibəɽanə	[nibɽano]	to be finished.
niba) nibha) neba) nebha)	[niba] [nibha] [neba] [nebha]	to extinguish.
noya	[nowa]	to bend, to bow.
neŋcanə	[næŋcano]	to walk as a lame.
nedanə	[dædano]	to give way (said of anything soft or flabby, as an undried mud wall or plaster).

nepa	[nɛpa]	to smear.
pə̃ũcha) pə̃ũcha)	[poucha]	to arrive at.
pəcakanə	[pɔckano]	to emit slightly.
pəcəpəcanə	[pɔcpɔcano]	to make the sound of slight splashing.
pəca	[pɔca]	to rot.
pəṭəkanə	[pɔṭkano]	to throw down.
pəṭəpəṭanə	[pɔṭpɔṭano]	to crackle.
pəṭa	[pɔṭa]	to come to terms.
pəɽa	[pɔɽa]	to read, to fall, to drop.
pəra	[pɔra]	to wear.
pəstanə	[pɔstano]	to regret.
paoya	[pawa]	to get.
pakəɽanə	[pakɽano]	to capture.
paka	[paka]	to ripen, to become grey.
pakhəlanə	[paklano]	to wash.
paŋa	[paŋa]	to perceive, to guess.
paṉhəɽanə	[paṉhɽano]	to throw in wrestling.
paṭhanə	[paṭhano]	to send.
paɽa	[paɽa]	to cast or lay down (as a mat), to pluck or gather (as fruits).
pata	[pata]	to spread
pada	[pada]	to expel the wind backwards.
pananə	[panano]	to send down milk to the nipples of the udder from a desire of giving milk (said of a cow or other animal).
para	[paṛa]	to be able to do anything.
palə̃ṭanə) palṭanə)	[palṭano]	to turn.

pala	[pala]	to rear.
palanə	[palano]	to escape, to run away.
piklanə	[piklano]	
pĩdha) pindha)	[pĩdha]	to wear.
pichəlanə	[pichlano]	to slip.
pichanə	[pichano]	fall back.
piʈa) peʈa)	[piʈa]	to strike, to beat.
piʈəpiʈanə	[piʈpiʈano]	to blimk, to wink.
piʂa) peʂa	[piʃa] [peʃa]	to pound.
põta) pota)	[põta] [pota]	to bury.
poɽa	[poɽa]	to burn.
puura	[pura]	to fill or to become filled.
põkanə	[põkano]	to make muddy.
põcanə	[põcano]	to screw, to twist.
põja	[põja]	to card (cotton, wool, etc.).
peɽanə	[peɽano]	to grind.
põca) põcha)	[põca] [põcha]	to wipe.
poyanə	[powano]	to pass (as the night) to endure.
pora	[pora]	to load, to fill.
poʂa	[poʃa]	to tame.
phəla	[phɔla]	to bear fruit.
phənkanə	[phɔnkano]	to simmer with anger.
phəska	[phɔʃka]	to become loose.
phãpa	[phãpa]	to swell.

phãsa	[phãʃa]	to become noosed.
phaʈəlanə	[phaʈlano]	to split, to burst.
phaʈa	[phaʈa]	to crack.
phaɽa	[phaɽa]	to tear.
phira)	[phira]	to turn.
phera)	[phera]	
phũka	[phũka]	to blow with the mouth.
phõɽa)	[phõɽa]	to pierce.
phoɽa)	[phoɽa]	
phõpanə)	[phõpano]	to breath short, to sob.
phopanə)	[phopano]	
phũyanə)	[phũano]	to blow with the mouth.
phuyanə)	[phuano]	
phukəranə	[phukrano]	to call aloud.
phoʈa	[phoʈa]	to boil, to open, to blossom.
phuranə	[phurano]	to be exhausted.
phula)	[phula]	to swell.
phola)	[phola]	
phusəlanə	[phuʃlano]	to cajole.
pheka	[phæka]	to throw.
pheʈa	[phæʈa]	to stir, to heat.
phela	[phæla]	to throw.
baoya	[bɔwa]	to carry, to blow, to flow.
bɔka	[bɔka]	to talk much.
bəʈe [1]	[bɔʈe]	He is, it is.
bɔrtanə	[bɔrtano]	to become, to happen.
bədəlanə	[bɔdlano]	to change.
berʂa	[bɔrʃa]	to rain.

1. See Defective verbs § 3

bəla	[bəla]	to speak.
bəsa	[bəʃa]	to sit.
baoya	[bawa]	to drive (as a boat) to row.
bãka	[bãka]	to bend, to twist.
bãça	[bãça]	to live.
bãṭa	[bãṭa]	to pound, to distribute.
bãdha	[bãdha]	to bind.
bacha	[bacha]	to pick out, to select.
baja	[baja]	to sound (as a musical instrument) to strike (as a clock).
baṛa	[baṛa]	to grow, to increase.
badha	[badha]	to hinder, to prevent.
bananə	[banano]	to build, to make.
basa [1]	[baʃa]	to like (ill or well).
bĩdha	[bĩdha]	to pierce, to bore.
bikanə	[bikano]	to sell, to have a demand for market.
bigəṛanə	[bigṛano]	to change, to vitiate.
biceṛanə	[biçṛano]	to seek, to search.
bicheṛanə	[bichṛano]	to strew, to scatter.
bichanə	[bichano]	to spread.
biṛəbiṛanə	[biṛbiṛano]	to mutter, to grumble.
binanə	[binano]	to plait, or braid (as the hair).
biyanə) biyonə)	[biano] [biono]	to give birth to.
bilanə) bilonə)	[bilano] [bilono]	to give away.
biṣanə	[biʃano]	to poison.

1. See Defective verbs § 3

buja) bũja)	[buja] [bũja]	to be filled or filled up.
bujha) bojha)	[bujha] [bojha]	to understand, to know.
buɽanə) boɽanə)	[buɽano] [boɽano]	to drown, to dip, to become old.
buna) bona)	[buna] [bona]	to sow.
bulanə	[bulano]	to rub, to stroke lightly over the surface of anything.
beca	[beca]	to sell.
beɽa	[beɽa]	to enclose, to surround.
beɽanə	[beɽano]	to walk, to stroll.
beɽonə	[beɽono]	to strike, to thrash.
bela	[bæla]	to roll out (bread).
bolanə	[bolan]	to call, to send for.
bhəja	[bhɔja]	to worship.
bhəɽəkanə	[phɔɽkano]	to be confounded.
bhəɽəbhəɽanə	[bhɔɽbhɔɽano]	to talk gibberish, to gabble.
bhəra	[bhɔra]	to fill up, to load.
bhãja	[bhãja]	to fold, to plait.
bnãɽanə	[bhãɽano]	to deceive, to speak or play false.
bhaga	[bhaga]	to flee to run away.
bhaŋja	[bhaŋja]	to break.
bhaja	[bhaja]	to fry, to roast.
bhana	[bhana]	to husk in a mortar (as rice).
bhapa	[bhapa]	to emit steam or vapour.
bhaba	[bhaba]	to think.
bhasa	[bhaʃa]	to float.

bhiɟa	[bhija]	to get wetted.
bhiɽa	[bhiɽa]	to come along side the shore (said of a boat) to draw near.
bhoga	[bhoga]	to suffer.
bhoɳa	[bhona]	to scorch, to fry.
bhola	[bhola]	to forget.
bheɲcanə) bhe canə)	[bhæɲcano]	to make faces.
bhekanə	[bhækano]	to be confounded.
bheja	[bheja]	to send.
bhejanə	[bhæjano]	to shut, to close(doot etc.) without bolting.
bheɽa	[bheɽa]	to meet.
bhebəranə	[bhæbrano]	to be frightened or alarmed.
məoyanə	[mowano]	to churn.
məcəkanə	[məckano]	to be wrenched or strained.
məja	[məja]	to immerse, to be absorbed.
məɟanə	[məɟano]	to immerse, to ruin.
məɽəkanə	[məɽkano]	to snap or crack (as finger joint).
məta) məthа)	[məta] [məthа]	to churn, to knead.
məra	[məra]	to die.
məla	[məla]	to smear, to rub.
makha	[makha]	to smear, to knead.
maga	[maga]	to beg, to ask for.
maɲa	[maɲa]	to beg, to ask for.
maja	[maja]	to scour, to rub.
maɽa	[maɽa]	to pound, to bruise.

mata	[mata]	to be stimulated, to be stirred up.
mathanə	[mathano]	to get to the top of(a tree) to interfere.
mana	[mana]	to mind, to obey.
mapa	[mapa]	to measure.
mara	[mara]	to beat, to kill.
micəkanə	[mickano]	to smile.
miʈa	[miʈa]	to subside.
mila) mela)	[mila] [mela]	to come in to contact, to meet.
miʃa) meʃa)	[miʃa] [meʃa]	to mix.
mukhanə	[mukhano]	to turn the face towards.
mucanə	[mucano]	to open slightly or partially.
mocəɽanə	[mocɽano]	to twist.
mocha	[mocha]	to wipe, to blot out.
muʈanə) muʈhanə)	[muʈano] [muʈhano]	to grasp with the hand.
moɽa	[moɽa]	to cover, to wrap.
muɽanə	[muɽano]	to shave, to cut off.
munɖanə	[munɖano]	to shave. to cut off.
muta	[muta]	to pass urine.
muulanə	[mulano]	to bargain, to buy.
yaoya	[jawa]	to go.
yaca	[jaca]	to beg, to ask for.
yuʈa) yoʈa)	[juʈa] [joʈa]	to come (to a person or place).
yuɽa) yoɽa)	[juɽa] [joɽa]	to join, to unite.

yuɽanə	[juɽano]	to cool, to become cool.
yota	[jota]	to yoke.
yõka	[jõka]	to measure.
yoganə	[jogano]	to supply, to provide with.
rəgəɽanə	[rɔgɽano]	to rub.
rəca	[rɔca]	to make, to compose.
rəɽa	[rɔɽa]	to be spread (as a rumour).
rəɽa	[rɔɽa]	to run.
rəpəɽanə	[rɔpəɽano]	to cause to move or walk about constantly.
rəsanə	[rɔʃano]	to be damp or moist.
rəoya	[rɔwa]	to be, to remain.
rãdha	[rãdha]	to cook.
rakha	[rakha]	to keep.
raga	[raga]	to become angry.
raŋanə	[raŋano]	to redden.
roa	[roa]	to transplant, to plant.
roka	[roka]	to stop.
rokha	[rokha]	to be ready to assault.
roca)		to be angry.
ruca)		to meet with one's haste.
roɽa	[roɽa]	to get annoyed.
rodha		to close, to obstruct.
ruʂa	[ruʃa]	to get angry.
ləoya	[lowa]	to take, to receive.
ləgnanə	[ləglano]	to wait for marriage.
ləɽəkanə	[ləɽkano]	to hang, to suspend.
ləɽəkanə	[ləɽkano]	to move a bait before a fish.

ləɽa	[ləɽa]	to fight.
lətanə	[lətano]	to creep, to twine (as a creeper).
ləpeʈanə	[ləpʈano]	to fold up, to wrap together.
laga	[laga]	to be in contact with, to touch.
laɽa	[laɽa]	to stir, to move.
laphanə	[laphano]	to jump.
lukanə	[lukano]	to conceal.
luʈəpuʈanə	[luʈpuʈano]	to roll or tumble about.
luʈa) loʈa)	[luʈa] [loʈa]	to plunder.
luʈha	[luʈha]	to roll or tumble about.
lopha	[lopha]	to catch in the air (as a play ball).
lekha	[lekha]	to write.
lepa	[læpa]	to smear.
lelanə	[lælano]	to set (a dog) upon.
leoya	[lewa]	to lick.
ʃəʈəkanə	[ʃəʈkano]	to slip off or away.
ʃana	[ʃana]	to sharpen (a knife).
ʃapa	[ʃapa]	to abuse, to curse.
ʃasana	[ʃaʃano]	to threaten.
ʃekha	[ʃekha]	to learn.
ʃija) sija)	[ʃija]	to be boiled, to boil.
ʃukanə	[ʃukano]	to dry.
ʃõka	[ʃõka]	to smell.
ʃudherənə) ʃodherənə)	[ʃudrano] [ʃodrano]	to cleanse, to purify.
ʃoŋa	[ʃoŋa]	to smell.

ʃodha	[ʃodha]	to pay off.
ʃudhanə) ʃodhano)	[ʃudhano] [ʃodhano]	to ask, to enquire.
ʃona	[ʃona]	to hear.
ʃuləkanə	[ʃulkano]	to kindle, to ignite.
ʃoʂa	[ʃoʃa]	to dry, to suck, to absorb.
ʃunlanə	[ʃulano]	to ache.
ʃoya	[ʃowa]	to sleep, to lie down.
ʂəʈəkanə) səʈəkanə)	[ʃɔʈkano]	to run away, to steal off.
səoya	[ʃɔwa]	to endure.
sətanə	[ʃɔtano]	to ooze, to drip.
sãjəɽanə	[ʃãjɽano]	to dress, to equip.
sãʈa	[ʃãʈa]	to be rigid, to fasten.
sãtərənə	[ʃatrano]	to swim.
sãtlanə	[ʃãtlano]	to singe in oil or ghee.
sẽdhanə	[ʃẽdhono]	to go into, to enter.
saja	[ʃaja]	to dress.
sadha	[ʃadha]	to perform, to solicit.
sapəʈanə	[ʃapʈano]	to fold, to grasp firmly.
sara	[ʃara]	to repair.
sĩyanə) siyanə)	[ʃĩano] [ʃiano]	to sew.
sõpa	[ʃõpa]	to make over, to bestow.
sujha	[ʃujha]	to listen, to understand.
sudhanə	[ʃudhano]	to ask, to interrogate.
sẽʈəkanə) sĩʈəkanə)	[ʃẽʈkano] [ʃĩʈkano]	to turn up (as the nose in disgust).

seka) sẽka)	[ʃəka] [ʃə̃ka]	to bake (as bread).
seca) sẽca)	[ʃɔca] [ʃɛ̃ɔa]	to irrigate, to bale out (as water from a boat).
həoya	[hɔwa]	to be, to become.
həkəcəkanə	[hɔkcɔkanə]	to be confounded.
həʈa	[hɔʈa]	to move backwards.
həɽəbəɽanə	[hɔɽbɔɽano]	to speak in a hurried an inarticulate manner.
kãka) haka)	[hãka] [haka]	to call aloud.
hãça	[hãça]	to sneeze.
hãʈəkanə	[hãʈkano]	to handle repeatedly, to seek for.
hãʈa	[hãʈa]	to walk.
hãpanə	[hãpano]	to breath hard.
hãʃa) haʃa)	[hãʃa] [haʃa]	to laugh.
haga	[haga]	to ease one's self.
hajanə	[hajano]	to rot in water.
hatəɽanə	[hatɽano]	to feel one's way.
hatanə	[hatano]	to secure or appropriate to one's self.
hana	[hana]	to strike.
hamələnə	[hamlano]	to bleat as a calf.
hara	[hara]	to be defeated, to lose.
hedlanə	[nedano]	to long for.
hela	[hɛla]	to slope, to wave to and fro.
hoɽanə	[hoɽano]	to gather, to form a crowd.

2 Text of Recordings[1]

Indicative — Non-Causative verbal forms

Person	1	2			3	
Grade		F	O	H	F/O	H
Simp. Pres.	[kaʈi] 2 'I cut'	[kaʈiʃ] 'You cut'	[kaʈo] 'You cut'	[kaʈen] 'Please cut	[kaʈe] 'he cuts'	[kaʈen] 'he cuts'
Prog. Pres.	[kaʈchi] 'I am cutting'	[kaʈchiʃ] 'You are cutting'	[kaʈcho] 'You are cutting'	[kaʈchen] 'you are cutting'	[kaʈche] 'he is cutting'	[kaʈchen] 'he is cutting'
Perf. Pres.	[keʈechi] 'I have cut'	[keʈechiʃ] 'You have cut'	[keʈecho] 'You have cut'	[keʈechen] 'You have cut'	[keʈeche] 'he has cut'	[keʈechen] 'he has cut'
Simp. Past.	[kaʈlam] 'I cut'	[kaʈli] 'You cut'	[kaʈle] 'You cut'	[kaʈlen] 'You cut'	[kaʈlo] 'he cut'	[kaʈlen] 'he cut'
Prog. Past.	[kaʈchilam] 'I was cutting'	[kaʈchili] 'You were cutting'	[kaʈchile] 'You were cutting'	[kaʈchilen] 'You were cutting'	[kaʈchilo] 'he was cutting'	[kaʈchilen] 'he was cutting'
Perf. Past.	[keʈechilam] 'I had cut'	[keʈechili] 'You had cut'	[keʈechile] 'You had cut'	[ketechilen' 'You had cut'	[keʈechilo] 'he had cut'	[keʈechilen] 'he had cut'
Hab. Past	[kaʈtam] 'I used to cut'	[kaʈtiʃ] 'You used to cut'	[kaʈte] 'You used to cut'	[kaʈten] 'You used to cut'	[kaʈto] 'he used to cut'	[kaʈten] 'he used to cut'
Future	[kaqbo] 'I shall cut'	[kaqbi] 'You will cut'	[kaqbe] 'You will cut'	[kaqben] 'You will cut'	[kaqbe] 'he will cut'	[kaʈben] 'he will cut'
Imperative						
Present		[kaʈ] 'cut!'	[kaʈo] 'cut!'	[kaʈum] 'Please cut!'	[kaʈuk] 'let him cut'	[kaʈun] 'let him cut'
Future		[kaʈiʃ] 'cut!'	[keʈo] 'cut!'	[kaʈum] 'Please cut!'	[kaʈuk] 'let him cut'	[kaʈun] 'let him cut'

2. Translation is not meant to be idiomatic.

1. For the rest of recordings of the verbal forms used for the pens & the knife, see pp. 5-6.

Non-finite

[kaɬa] 'to cut' [keɬe] 'having cut' [kaɬon] 'to cut' [kaɬte] 'to cut'

[kaɬle] 'If(one) cuts'

Causative forms

Indicative

Person	1	2			3	
Grade		F	O	H	F/O	H
Simp.Pres.	[kaɬai] 'I cause to cut'	[kaɬaʃ] 'You cause to cut'	[kaɬao] 'You cause to cut'	[kaɬan] 'You cause to cut'	[kaɬae] 'He causes to cut'	[kaɬan] 'He causes to cut'
Prog.Pres.	[kaɬacchi] 'I am causing to cut'	[kaɬacchiʃ] 'You are causing to cut'	[kaɬaccho] 'You are causing to cut'	[kaɬacchen] 'You are causing to cut'	[kaɬacche] 'He is causing to cut'	[kaɬacchen] 'He is causing to cut'
Perf.Pres.	[kaɬiechi] 'I have caused to cut'	[kaɬiechiʃ] 'You have caused to cut'	[kaɬiecho] 'You have caused to cut'	[kaɬiechen] 'You have caused to cut'	[kaɬieche] 'He has caused to cut'	[kaɬiechen] 'He has caused to cut'
Simp.Past	[kaɬalam] 'I caused to cut'	[kaɬali] 'You caused to cut'	[kaɬale] 'You caused to cut'	[kaɬalen] 'You caused to cut'	[kaɬalo] 'He caused to cut'	[kaɬalen] 'He caused to cut'
Prog.Past	[kaɬacchilam] 'I was causing to cut'	[kaɬacchili] 'You were causing to cut'	[kaɬacchile] 'You were causing to cut'	[kaɬacchilen] 'You were causing to cut'	[kaɬacchilo] 'He was causing to cut'	[kaɬacchilen] 'He was causing to cut'
Perf.Past	[kaɬiechilam] 'I had caused to cut'	[kaɬiechili] 'You had caused to cut'	[kaɬiechile] 'You had caused to cut'	[kaɬiechilen] 'You had caused to cut'	[kaɬiechilo] 'He had caused to cut'	[kaɬiechilen] 'He had caused to cut'
Hab.Past	[kaɬaɬam] 'I used to cause to cut'	[kaɬaɬiʃ] 'You used to cause to cut'	[kaɬate] 'You used to cause to cut'	[kaɬaten] 'You used to cause to cut'	[kaɬaɬo] 'He used to cause to cut'	[kaɬaɬen] 'He used to cause to cut'

Person	1	2			3	
Grade		F	O	H	F/O	H
Future	[kaɽabo] 'I shall cause to cut'	[kaɽabi] 'You will cause to cut'	[kaɽabe] 'You will cause to cut'	[kaɽaben] 'You will cause to cut'	[kaɽabe] 'He will cause to cut'	[kaɽaben] 'He will cause to cut'
Imperative						
		[kaɽa] 'cause to cut!'	[kaɽao] 'cause to cut!'	[kaɽan] 'Please cause to cut'	[kaɽate^{K}] 'Let him cause to cut'	[kaɽan] 'Let him cause to cut'
		[kaɽaʃ] 'cause to cut!'	[kaɽio] 'cause to cut!'	[kaɽan] 'Please cause to cut!'	[kaɽak] 'Let him cause to cut'	[kaɽan] 'Let him cause to cut'
Non-finite						
		[kaɽano] 'to cause to cut'	[kaɽie] 'having caused to cut'	[kaɽate] 'to cause to cut'	[kaɽale] 'If (one) causes to cut'	

APPENDIX 3.

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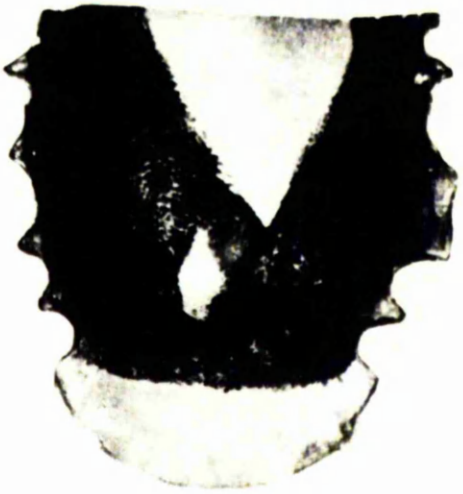
44. [bhaɲche]

45. [khabe]

46. [chape]

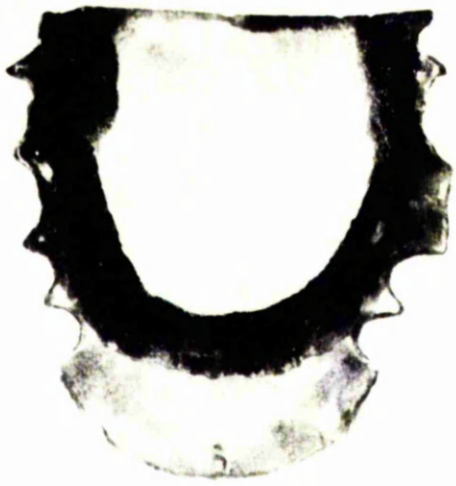
47. [ɟɔpe]



48. [ɟhume]

49. [ʈhek]

50. [dak]



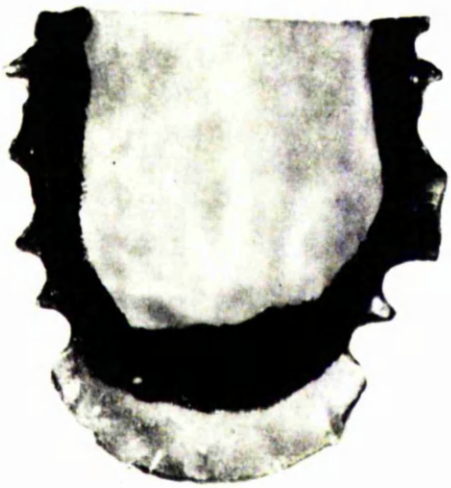
51. [thame]

52. [dome]

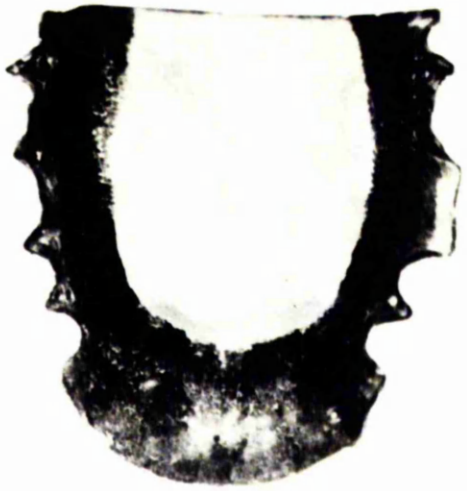
53. [mothe]

54. [kace]

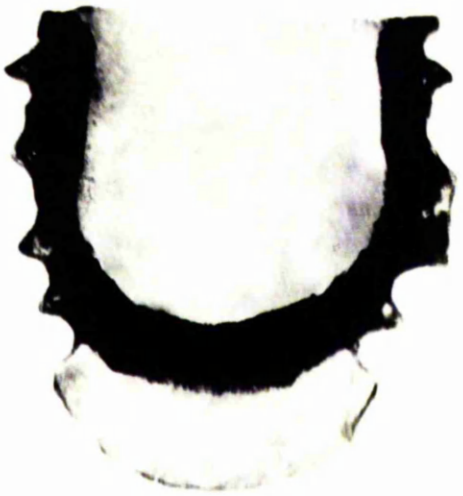
55. [manie]



56. [mɔth]



57. [palʈe]



58. [manbe]

59. [bɔl]

60. [pɔre]

61. [pɔr]

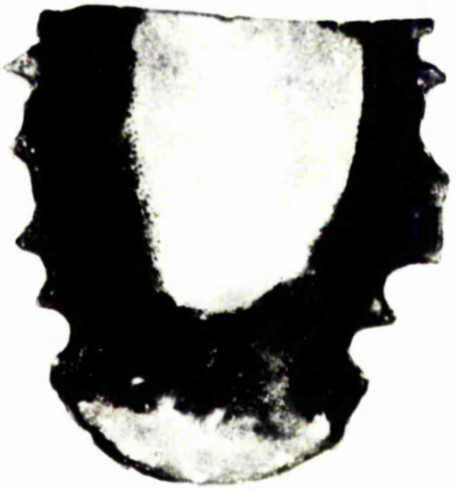
62. [mile]

63. [mille]

64. [pate]

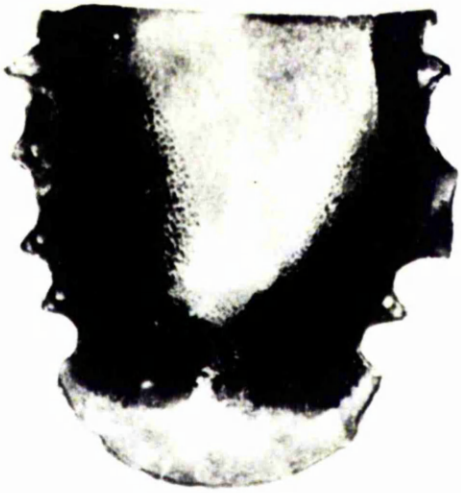
65. [patte]

66. [kacche]



67. [mante]

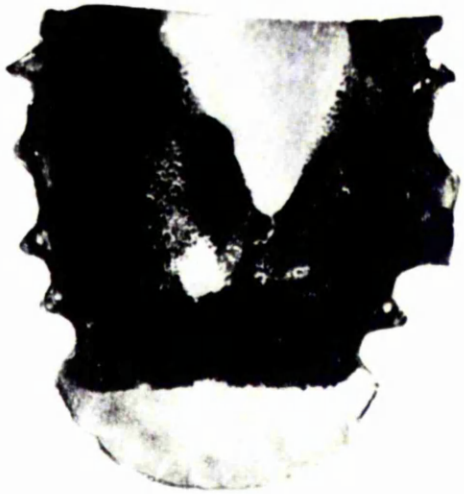
68. [korche]



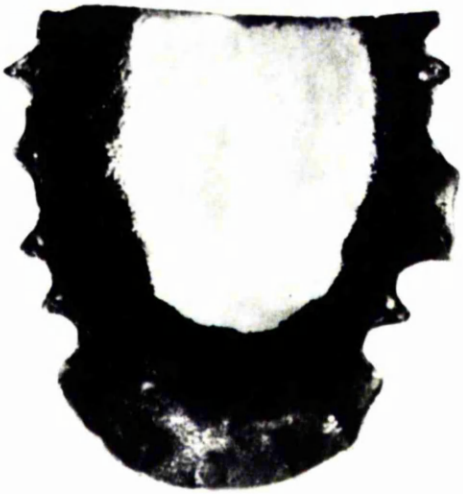
69. [korte]

70. [korle]

71. [kocche]



72. [kotte]

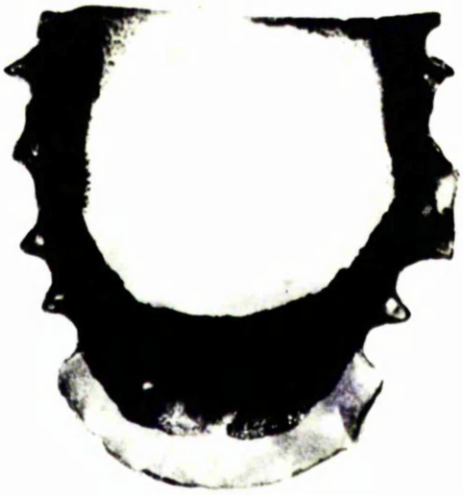


73. [kolle]

74. [kaete]

75. [kaste]

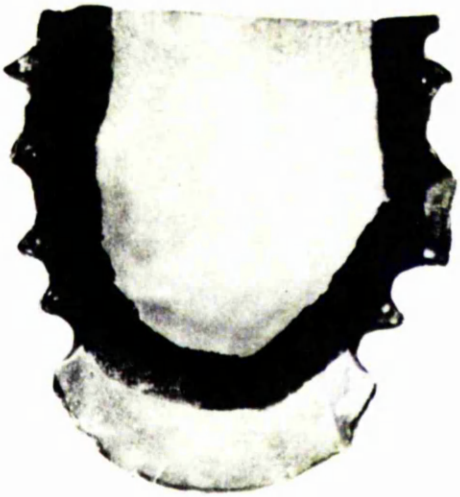
76. [kaʧle]



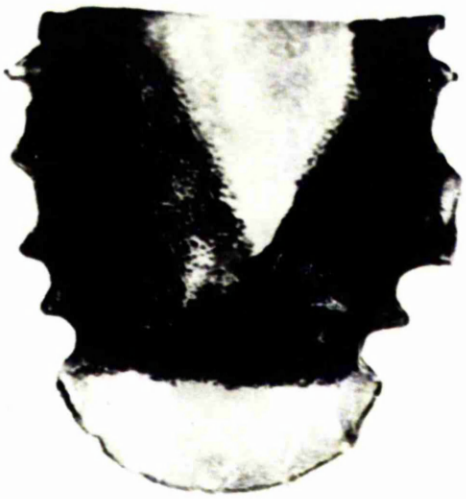
77. [boʃche]

78. [boʃte]

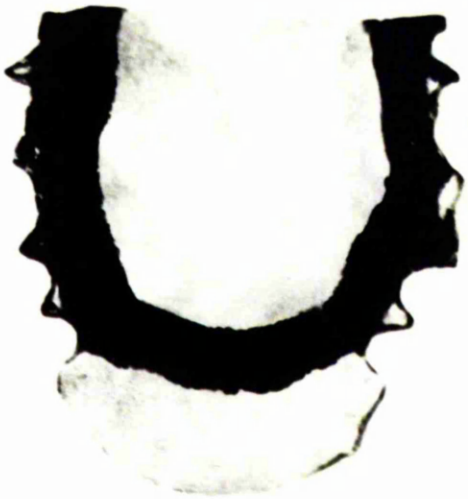
79. [boʃle]



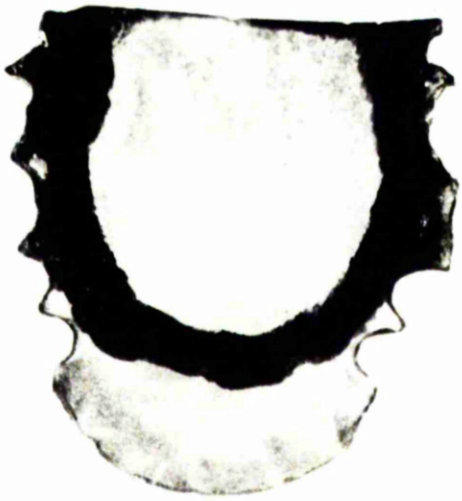
80. [bãc]

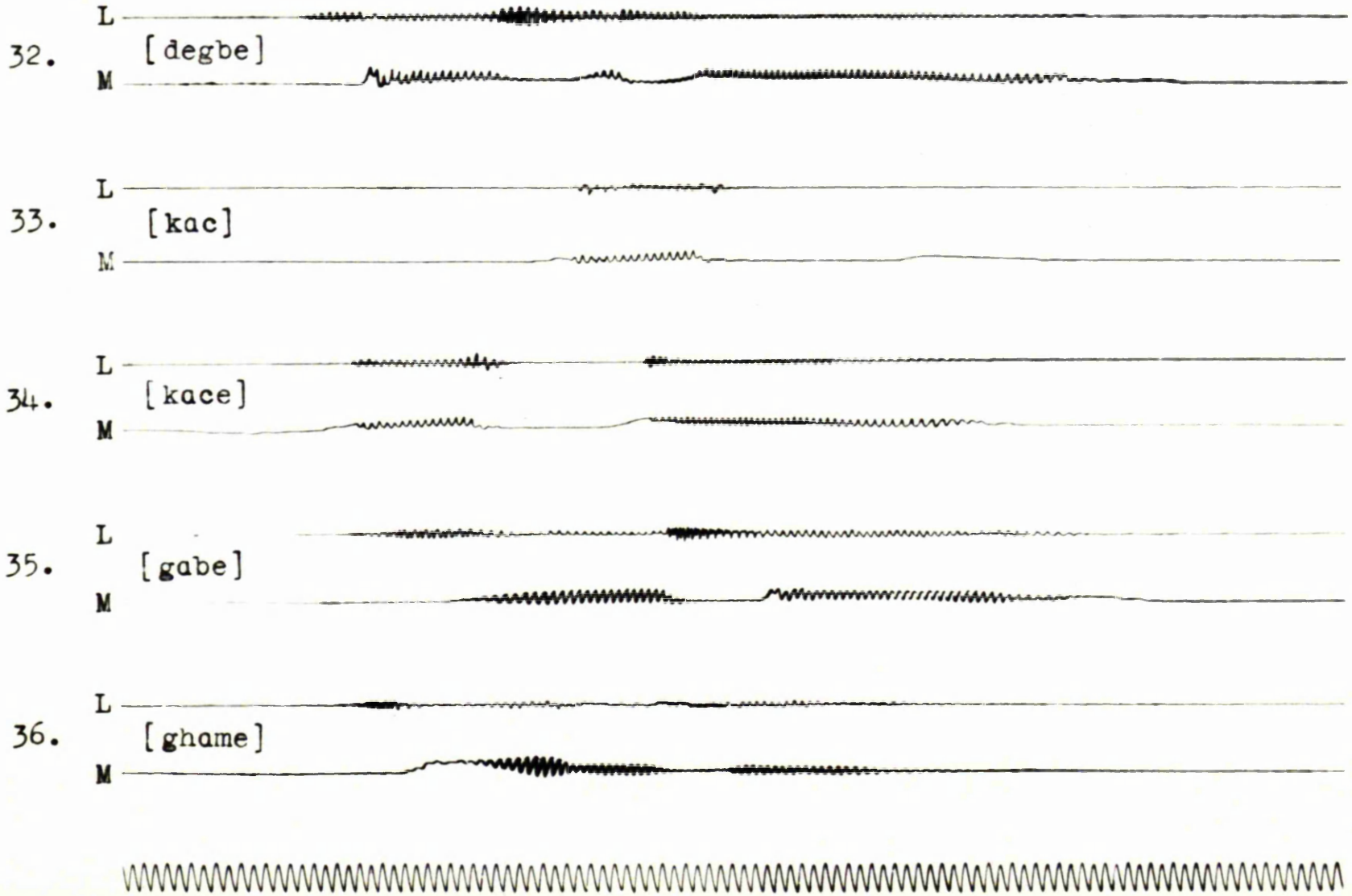


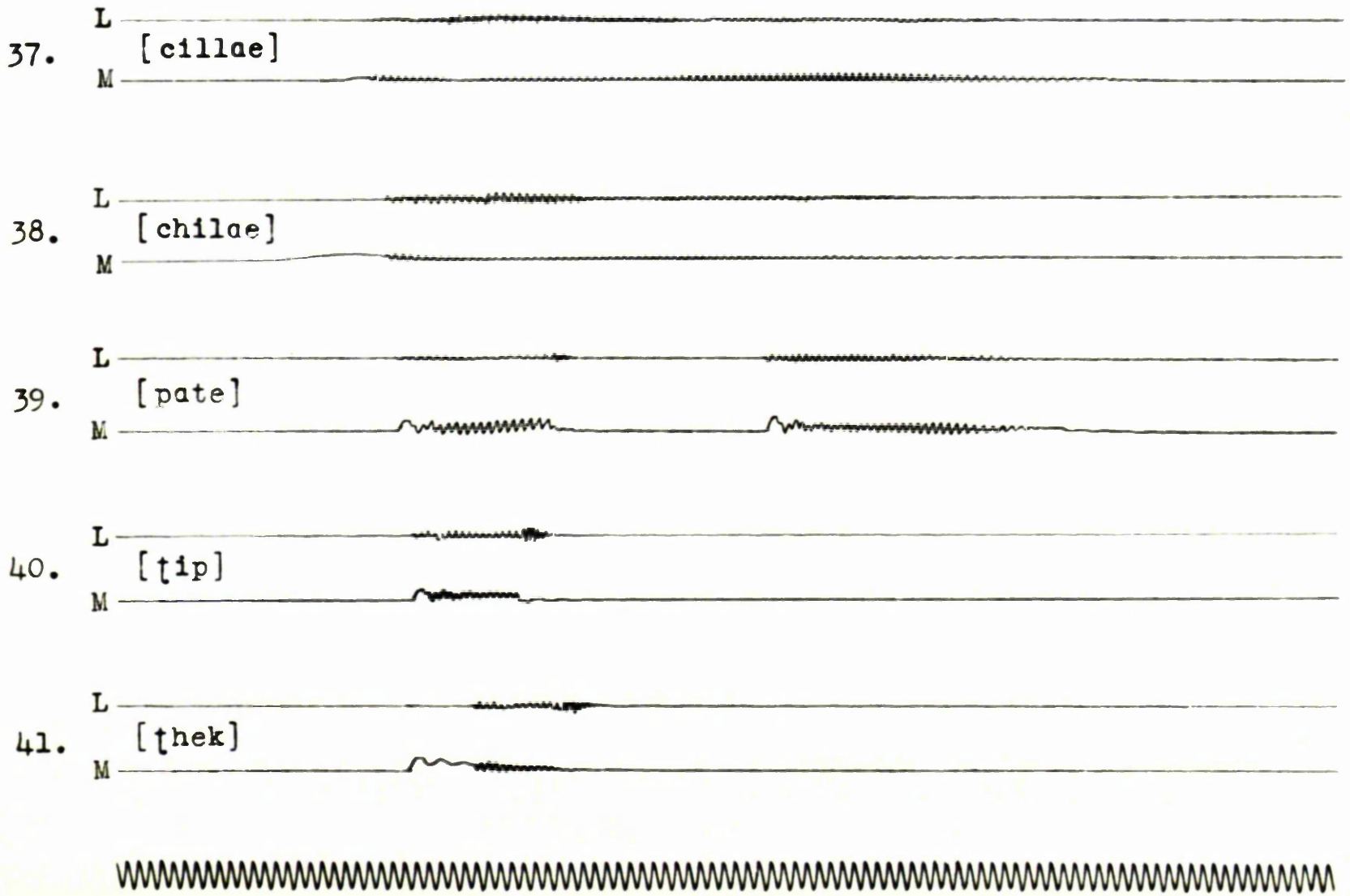
81. [nobo]



82. [khɔŋɖa]




L
32.
[degbe]
M
L
33.
[kac]
M
L
34.
[kace]
M
L
35.
[gabe]
M
L
36.
[ghame]
M

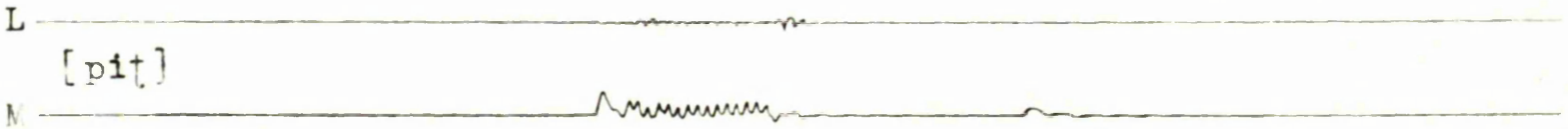

37.
L
[cillae]
M
38.
L
[chilae]
M
39.
L
[pate]
M
40.
L
[ṭip]
M
41.
L
[ṭhek]
M

42. [tape]

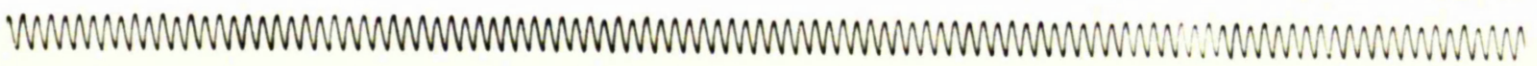
43. [thame]

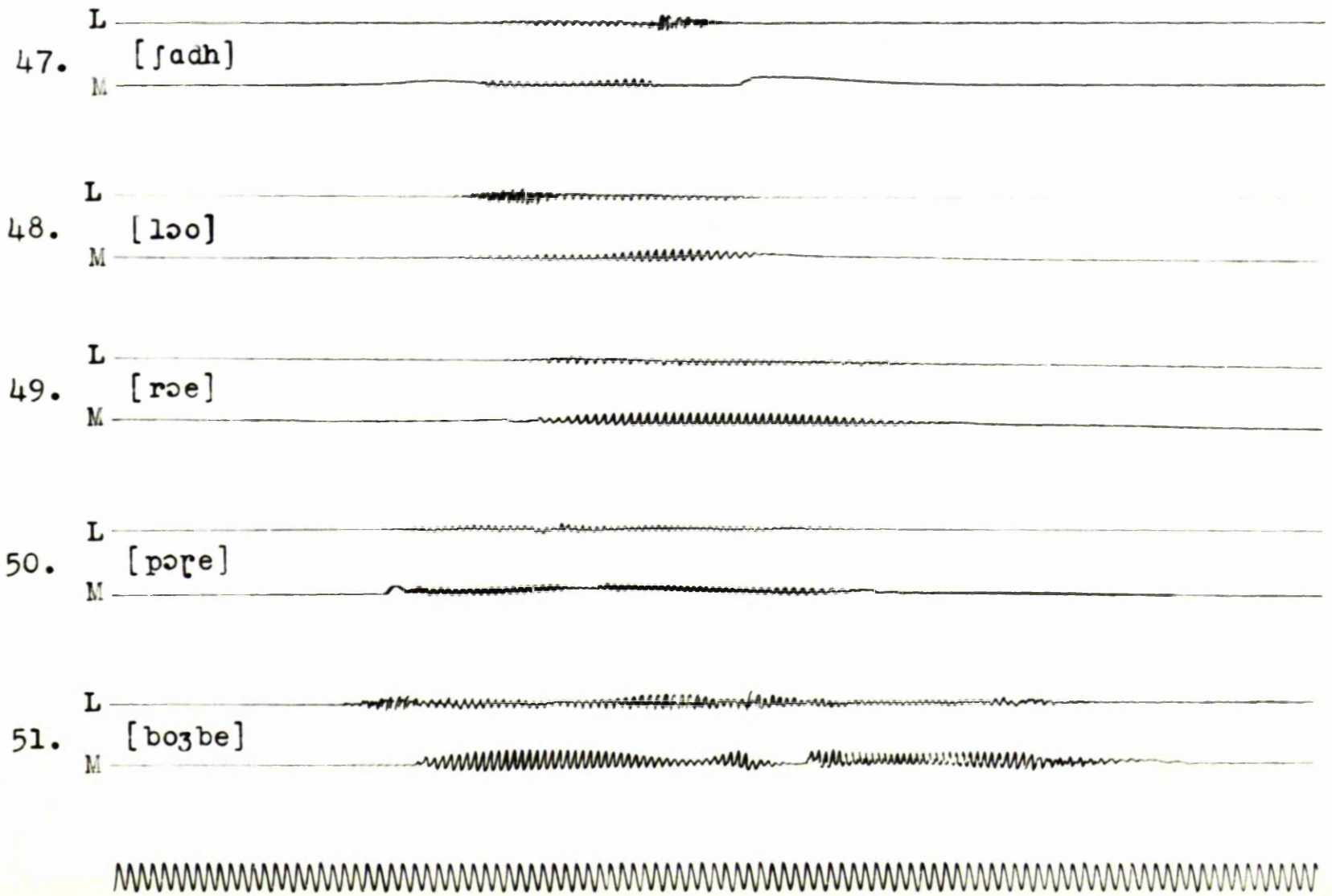
44. [dhɔre]

45. [pit]



46. [pat]




L
47. [ʃɑdh]
M
L
48. [lɔo]
M
L
49. [rɔe]
M
L
50. [pɔɾe]
M
L
51. [boʒbe]
M

52. [boʃte]

53. [ʃəmjae]

54. [khamcae]

55. [ʧunʧunae]

56. [jhɔmjhɔmie]

57. L [kacche] M

58. L [patte] M

59. L [jagle] M

60. L [pakle] M

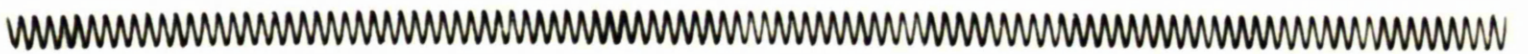
61. L [korte] M

62. [kotte]

63. [korche]

64. [kocche]

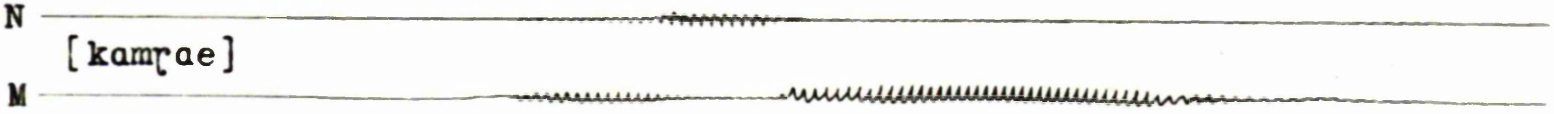
65. [kacte]



66. [bhaŋ]

67. [jɔm]

68. [kamʈae]

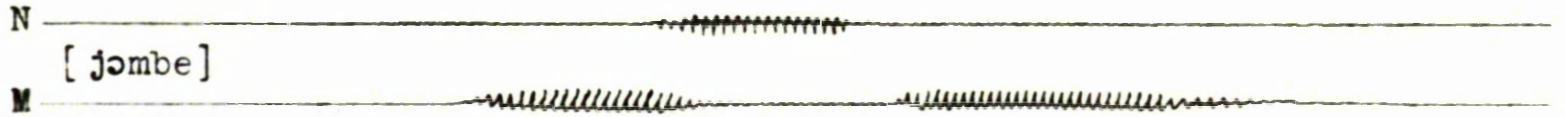


69. [cimʈae]

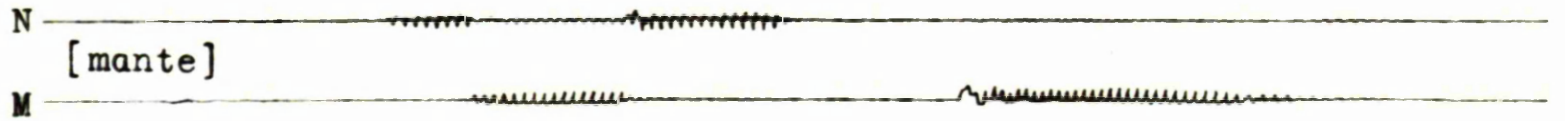
70. [jɔnmae]

71. N [minminae] M

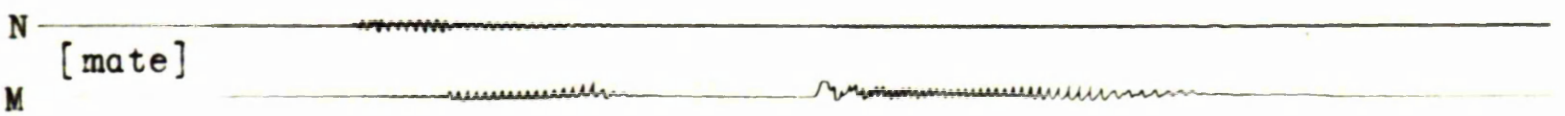
72. N [jɔmbe] M



73. N [mante] M

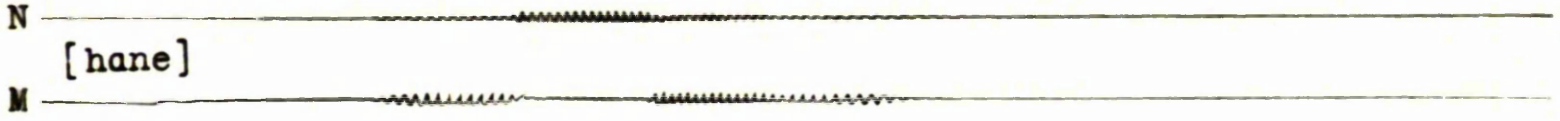


74. N [mate] M



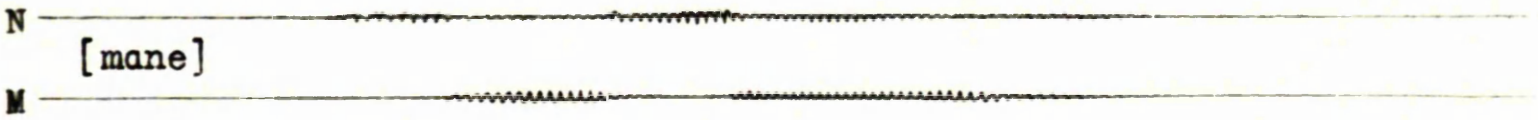
75. [jɔme]

76. [hane]



77. [ane]

78. [mane]



79. [bhaɳe]